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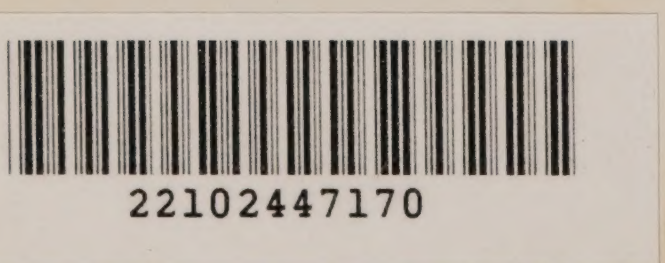
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TRANSACTIONS

OF THE

Odontological Society of Great Britain.

VOL. VI.—NEW SERIES.

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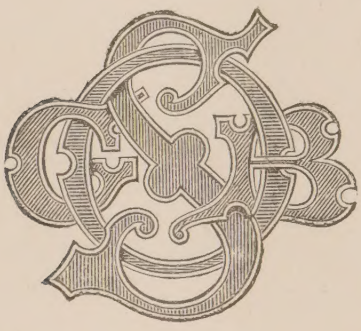
ODONTOLOGICAL SOCIETY

OF

GREAT BRITAIN.



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GENERAL MONTHLY MEETING.

Monday, November 3, 1873.

ISAAC SHEFFIELD, Esq., President, in the Chair.

The President, on taking the Chair, said :—

Gentlemen,—It is not unusual, I think, to offer a few words of congratulation upon the re-assembling of friends, whether social or professional ; and I have ventured, therefore, to jot down, as it were, a few thoughts, not altogether unsuited, I trust, to the character of this our first meeting after the usual period of our relaxation. I have already experienced so much kind indulgence at your hands—an indulgence, the more deeply appreciated, as I feel so forcibly, how imperfect have often been my best efforts to discharge the duties incidental to the office I hold,—I have so often, I say, experienced this indulgence at your hands, that I feel the less hesitation to ask it now for a few moments before we proceed to the ordinary business of the evening. It is just possible that to some of the members of our Society,—may I say, more especially to the *older* ones,—the return from a happy holiday to the stern realities of professional life in this our modern Babylon may not be without something of that rebellious struggle against duty, with which our great dramatist so quaintly, yet so truthfully, invests the young morning of our school days. For myself, however, I can gladly affirm that the resumption of *my* duties as your President, thanks to your kind consideration and unfailing courtesy, is fraught with unmingled satisfaction and pleasure. Let me say that I am, indeed, most happy to meet again so goodly a gathering (under the circumstances) of our members ; and I trust sincerely that all who are here assembled have thoroughly

enjoyed and profited by the temporary relaxation that we have been permitted to take. If, indeed, the metaphor employed by the genial lyric bard of old Rome was true in *his* day,—"Non semper arcum tendit Apollo,"—how much more emphatically is its appositeness appreciated *now* by the toil-worn, brain-oppressed professional man, after the prolonged and tense strain of a London season. And yet, I would venture to remark, the mere *escape* from the *scene* of labour is not sufficient. So closely are the material and the moral inwrought in this wondrous fabric of our being, so mysteriously do they re-act upon each other, that it is quite possible for a man to place a thousand miles between himself and the daily round of his professional toil, and yet his search for renewed energy of body and mind be all in vain. If only the "atra cura" of the poet, the dark brooding care, not seldom the result of professional anxieties, "sits behind the rider," or dogs the steps of the distant traveller, then, alas! all the health-giving, spirit-inspiring elements of the scenes which he is traversing, or in which he seeks rest, are for him as though they were not. Though seemingly free, he is still bound in the spirit, as it were, to the wheel of his daily toil; at every remove he only "drags a lengthening chain," not composed, however, as in the tender theme of our own "Goldsmith" of golden links of love, but a chain "strong as iron bands" or triple brass, and in its crushing effects upon the spirit and the life, as cruel and remorseless as the grave. To quote again from the same old Roman bard, he is one of those, of whom the poet says :—

"Cœlum, non *animum*, mutant, qui trans mare currunt."

In vain for *him*, therefore, the storied romance, and the classic beauty of the Rhineland. All in vain, too, as regards their elevating influences and recuperative powers, the sublime grandeur, and majestic repose of Alpine heights. In this matter, I can speak from very vivid and deeply painful recollections of the past; and on the principle "crede experto," may venture to offer to each of my younger professional brethren a word of friendly caution, as to the danger of a too deep absorption in the pursuit of their profession, despite the bright side, presented in all its

attractiveness, by intense devotion to work and the charm of professional enthusiasm. I do heartily trust, however, that this is not the sad experience of any one of my friends who are present to-night; nay rather, but that each for himself has been enabled to find, during our vacation, an ample store of recruited energy for the "battle of life"; whether sought abroad, or on the breezy uplands of our own Highlands, or amid the exquisite scenery of our English lakes. Or if, haply, some of us have been content to "rest and be thankful" in the peaceful shelter of some unobtrusive spot upon the coast, I trust that even *here* they have felt the quiet happiness of the poet's "dulce est desipere," in a good sense; in "leaving their prints upon the sands," not indeed "of Time," but, as in childhood's joyous days, upon those of the hoary deep. And now, in concluding my remarks, let me repeat the expression of my pleasure in again meeting you,—a pleasure not unmingled, I may be permitted to observe, with thankfulness. This last is indeed a feeling that we may *all* share, when we reflect that, as travellers, we seem to have fallen upon days in which, to the old poetic formula of

"Moving 'scapes by flood and field,"

may be added the terrible risks by rail,—the not illogical product, perhaps, of a "*fast*" age.

The Minutes of the Meetings of June the 9th were read and confirmed.

The following gentlemen were nominated for membership:—

Mr. John Henry Phillips, 5, Cavendish Square, resident.

Mr. Augustus Cronin, 120, New Bond Street, resident.

Mr. A. L. Northrop, M.D., D.D.S., New York, non-resident.

Mr. J. H. Hitchcock, M.D., D.D.S., Boston, non-resident.

Mr. Thomas J. H. Westall, 4, Courtenay Terrace, Devon Square, Newton Abbott, non-resident.

Mr. D. A. Wormald, 8, Bank Street, Bury, Lancashire, non-resident.

Mr. C. J. Wallis, Pau, Basses Pyrénées, non-resident.

Mr. Isidor Lyons, M.R.C.S., L.R.C.P.Edin., L.S.A., L.D.S., was elected a Member of the Society.

The following donations to the Library were announced :—

"Calendar of the Royal College of Surgeons of England."

"Eighth Report of the Quekett Microscopical Club."

"The Journal of the Quekett Microscopical Society."

The following donations to the Museum were announced :—

Model of upper jaw, in which positions of cuspidate and first bicuspid were transposed. Presented by Mr. Charles White.

Large salivary calculus. Presented by Mr. C. J. Fox.

Rough metallic denture, cast by an amateur from an old plate, and worn by a patient; also, tooth having the form of a bicuspid removed between first and third molars. Presented by Mr. Edwards, of Liverpool, through Mr. C. J. Fox.

The President.—I am glad to announce that a gentleman from the other side of the Atlantic, Dr. Chance, will kindly give us his experience in the use of gold-pointed instruments for stopping teeth.

Dr. Chance.—Mr. President and Gentlemen,—I feel it an honour to be permitted to address such an assemblage; but having a love for our profession, I think that if I can offer my mite to the good of the whole, I shall only be doing that which it is my duty to do. Having received thousands of ideas from the various members of the profession, it would be very bad indeed if I could not contribute one item. I have one idea to offer to-night, and it is one conceived in my mind through experience, viz., that the use of a gold point for the introduction of the gold in stopping teeth would be preferable to a steel one. My views in reference to these gold points are embodied in a paper in the "British Journal of Dental Science." It is

conceded on our side of the water that a cohesive gold filling comes nearer perfection than any other form of stopping; and if the cohesive relations of the gold are imperfect, the object aimed at is defeated. I claim that that, to a certain extent, becomes the case when a steel instrument is used for the introduction of the filling. We are all aware that the gold-beater is very careful to keep any foreign material from coming in contact with the gold at the time he is manipulating it. If that is true of the gold-beater, it seems to me to follow that the dentist should be equally careful to keep foreign material from coming in contact with his gold while using it in the stopping of a tooth. I would suggest to gentlemen that if they have any old stoppings—cohesive so-called—that have been removed from teeth, and attempt to flatten them with a hammer, or put them through a rolling-mill without annealing, they will find that the gold fractures, and that there is not a union of the particles. Acting upon a knowledge of that fact, I prepared a cavity in a tooth, placed the tooth in a bench-vice, and filled it with three kinds of gold. My object was to show that it was the property of cohesion on which the perfection of filling depends. I used what we term Morgan's plastic gold, White's No. 4 foil, and some heavy roll gold that I melted and rolled from scraps. I used the gold point and a wooden mallet for the filling, and then, after breaking up the tooth, I placed the stopping under the hammer and then through the rolling-mill without annealing the gold. That specimen I have with me now; it has never been in contact with the fire since it left the tooth. (A thin plate of solid gold was produced and exhibited to the members.)

The PRESIDENT.—Have you used these gold points for any length of time?

Dr. CHANCE.—I have been using gold points since the commencement of last winter, and I have found them work to my entire satisfaction. I can truly say I have never had gold work so *kid-like* as it has done with me under the use of the gold instrument. There is something about it gentlemen must experience to fully appreciate. Mr. Sercombe, perhaps, will

give you his opinion on the subject; and with permission I will ask that a letter handed to me by Mr. Fox may be read to the Meeting.

The PRESIDENT.—Do you always manage to get the gold dense enough without twisting or bending your points?

Dr. CHANCE.—The instrument itself bears the standard of hardness required in a stopping, and that would be indicated whenever resistance is equal to the force by the yielding of the point. You have there the key to the amount of force to be employed in stopping a tooth, whether by hand-pressure or mallet.

The PRESIDENT.—There is not the same likelihood of cutting or disintegrating the gold?

Dr. CHANCE.—I claim that it will not cut the gold. If you examine a serrated steel instrument after a few months' usage, you will find that the steel points have become rounded; they certainly have lost substance, and, infinitesimal as it may be, the fact is there that small particles of steel are abraded from the point of the instrument, become commingled with the gold, and destroy that continuity which otherwise would take place.

Mr. SERCOMBE.—As Dr. Chance has mentioned my name, I may be allowed to make one or two remarks. Dr. Chance favoured me with a call shortly after his arrival in London, and laid before me these gold points, leaving two of them with me. Those two points I have used on several occasions, and, as far as I am able to form an opinion,—they were large points, and could not be used in a great number of cases,—I should say that Dr. Chance is justified in the remarks he makes as to the extreme kindness with which they work the gold. There is certainly that feeling which he describes as "kid-like" conveyed to the hand when the instrument is dealing with the gold foil. If I had smaller points than those Dr. Chance had left with me I could give a more reliable report of their adaptability in all cases. I do not know how far the material would be available when we use very fine points. The larger pointed instruments I can see no objection to. I do not find that they

have yielded with any degree of pressure I put upon them, which has been more severe than was perhaps necessary for stopping teeth.

The PRESIDENT.—Did you find in the particles of gold any liability to separation?

Mr. SERCOMBE.—There is very little risk of that even with a steel instrument—a large one. Certainly I did not find that this gold point went through at all, and I dealt with it rather roughly. I think I may say, in Dr. Chance's favour, that I used the instruments rather roughly for the purpose of testing them. I think we must all have observed with large fillings, when done with adhesive gold, that after they have been worn some time, if they give way at all, the surface left is very rough, rather as if it were honey-combed. That I suppose is due to the fact that one layer of gold has been placed upon another, not so much upon the principle of cohesion as upon mechanical principle; the serrated points have produced an irregular surface, upon which the succeeding layer of gold has been placed, and so on, until the tooth has been filled. We do not allow the patient to go away without a regular surface; it is nicely smoothed and burnished, and looks very finely finished; but as the surface begins to wear, the real condition of the stopping becomes manifest, when it presents that very honey-combed appearance. That I should think could not happen if the instrument used were not serrated; and if, as Dr. Chance claims, the use of this instrument which is not serrated produces perfect cohesion, it will certainly have a great advantage over instruments which are very much serrated.

The PRESIDENT then read a letter from Mr. C. J. Fox, stating that in his experience with the one small gold plugger he had made himself, which he sent for their inspection, he had found the truth of Dr. Chance's assertions that the cohesive gold packed therewith retained a better adhesive surface than when worked with a steel-pointed instrument; moreover, the work was carried out with greater ease and rapidity, and with less discomfort to the patient.

Dr. CHANCE.—In reference to the small points I will say that I have found that in using the gold points I can get an instrument small enough for any kind of cavity. And in reference to the surface, gentlemen will know that sometimes, when the tooth is partially filled, if they are using cohesive gold, the surface becomes in that condition in which it will not receive the next pellet; it scales off, and my experience has sometimes been that I have had to remove the filling and commence afresh. As was stated by Mr. Sercombe, when they scale they have that honey-combed appearance. If you take six or seven sheets of paper and prick through them, you can take the corner of one and lift up the whole; it is nothing more than a mechanical union; and I think I have sometimes been under the delusion that I had a cohesive gold filling when I had nothing more than several pieces of gold, one pricked into the other; and when I pressed my filling down, the point in one place not going as deep as in another, the filling scaled off, and I have had to commence afresh. That was my experience, and so I tried the gold points. Now I feel that I have a perfect filling if I keep my cavity dry. I feel that I have simply a piece of gold fitted to the shape of the cavity of the tooth in place of a number of pieces packed together. In reference to the pain in filling teeth: galvanic action is not set up by the use of the gold point as it is set up by the use of the steel. Gentlemen will remember that when they introduce the first pellet of gold into the cavity, and the steel instrument come in contact with the dentine and gold, the patient cringes a little. After they get the surface covered with the gold, that becomes less and less. That unpleasant experience the patient never has when the gold point is used, so that I claim that if we can fill teeth with less pain we have done something towards ameliorating the sufferings our patients experience at our hands. I may mention that the instruments are manufactured and for sale by Mr. Coxeter.

Mr. VANDERPANT.—We know that "gold" is a very ambiguous term. We have gold from about 7 carat up to 24. What is the quality of the gold that you propose to use for

the points of your instruments? and is it essential that we should use a particular quality of gold or an alloy of gold?

Dr. Chance.—I have found in practice 14 carat gold to be the best for the purpose. It will be sufficiently cohesive, though alloyed, to take up the gold pellet; but when this latter is presented to a purer gold—that is, the gold already packed in the cavity,—it will attach itself to this in preference to the alloyed point.

Mr. Charters White exhibited a model illustrating the case of a lady, aged 19, who still retained four temporary teeth, two in the upper and two in the lower jaw. There was also irregularity in position between the cuspidate and first bicuspids, which was unusual in character. He also exhibited, under the microscope, excellent stained sections of papillomatous growth removed from the mouth of a lady, occurring between the first and second bicuspids on the right upper maxilla. The patient applied to him for relief on account of the inconvenience experienced during mastication; a ligature applied to the tumour, which was about the size of a small haricot bean, could not be retained; when it was removed by excision, not followed by much hæmorrhage.

Mr. C. S. Tomes, referring to two specimens of interest which the museum had recently acquired, said, the first was that of a little girl, eleven years of age, upon whose front teeth, for the purpose of rectifying irregularity, an india-rubber band had been placed which had been forgotten. The teeth it encircled had become loosened and greatly elongated. On the patient presenting herself, her mother made a statement, which afforded a clue to the cause of the mischief, and upon careful examination the band was discovered and removed. The mischief done, however, was so great, that there was no chance of being able to restore the teeth to their normal position or firmness. The next specimen was one presented at their last meeting by Mr. Mummery. It was the lower jaw of a sheep, on the left side of which was a large cyst, which had to some extent collapsed, owing to imperfect ossification and boiling of the specimen. The peculiarity in it was that the temporary

canine and third incisor on both sides had been retained beyond the normal period for shedding; the consequent retardation of the permanent teeth had on one side of the jaw given rise to the cyst. On the other side one of the permanent teeth was not discoverable, although he had laid bare the bone with the view of finding it; still he believed it existed there, but in such a position that it never could be erupted. On both sides of the jaw were the temporary teeth retained, but had given rise to cystic disease on one only. The specimen was of interest in relation to the origin of one form of cystic disease, which had been the subject of discussion some years ago, and lately Dr. Magitot had laid it down as his opinion that cysts in the jaw were almost invariably more or less connected with the teeth, and that retarded eruption of a tooth was a frequent cause of these tumours.

Mr. Oakley Coles brought under the notice of the Society a remedy he had found very efficacious in the treatment of periodontitis. Having found the application of carbolic acid inconvenient, because unsuitable for self-application by the patient, he had employed thymol dissolved in spirits of wine. A piece of spongio-piline moistened with the solution was applied to the gum in the neighbourhood of the affected tooth.

On the Influence of the Teeth on Tongue Disease.

By W. Fairlie Clarke, M.A., M.B., Oxon, F.R.C.S., Asistant-Surgeon to Charing Cross Hospital.

Mr. President and Gentlemen,

There is hardly a disease of the tongue which may not be either caused or aggravated by an unhealthy condition of the teeth. I hope, therefore, that the subject which I bring before you this evening may not be without interest to the members of the Odontological Society.

A moment's reflection will suffice to show why it is that the influence of the teeth upon the tongue is so great. The tongue is a soft organ, essentially muscular, and making active movements in the performance of all its functions; but it lies in a cavity where it is hedged round on three sides by the teeth. When it is at rest, and the mouth is closed, it is in contact throughout the greater part of its extent with the teeth. They, as it were, fence it in; but, the moment it moves, it is brought into much more active contact with them. Whether its movements are

made for articulation or mastication, the tongue is pressed against the teeth, or carried along or beyond them; and in these movements it is liable to be injured by them in many ways. I do not speak of the injuries which the epileptic are liable to inflict upon themselves during their fits, nor of those which the sufferers from tetanus may incur by the spasmodic and forcible closure of their jaws; nor, again, shall I speak of those accidental cases in which the tongue is bitten and lacerated to a greater or less extent. All these are no doubt injuries inflicted by the teeth, but they do not fall within the scope of my subject; nor would there be much profit in dwelling upon them here, for, the teeth being only the instrument by which the wound is inflicted—the real cause having to be sought for elsewhere—such cases fall either under the care of the surgeon as accidents, or under that of the physician as the result of constitutional disease, and are not usually brought under the notice of the dentist.

What I propose to do in this paper is, to review some of the more common affections of the tongue, and to consider how far they are either caused or aggravated by a faulty condition of the teeth, such as the knowledge and manual skill of the dentist could relieve.

What I have to say on this subject will fall under two general heads. First, I shall speak of the ulcerative diseases of the tongue; and,

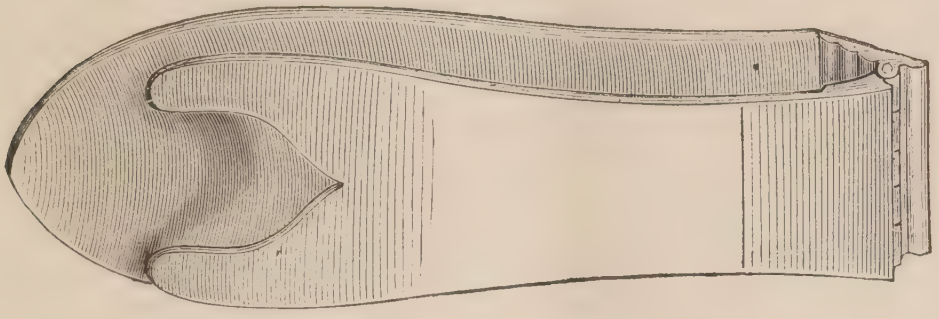
secondly, of its cancerous affections. If I mention what I have learnt, or what I have seen, of the effects of the teeth upon these two great classes of tongue disease, and if I allude incidentally to some of the rarer affections of the same nature, I shall probably have touched upon all the points that are of the most interest to my present hearers.

First, then, with regard to the ulcerative diseases of the tongue. These are of several kinds. There are simple or dyspeptic ulcers; there are syphilitic ulcers; and there are aphthous ulcers. Of these, the last, as you are well aware, depend upon the presence of a minute vegetable parasite—the *oidium albicans*,—which grows upon and destroys the epithelium. The epithelium falls off, and a flat superficial ulcer is left. As this minute fungus is only developed when the general health is much enfeebled,—as, for instance, in some infantile diseases, and with adults in the last stages of exhausting complaints, such as phthisis or cancer,—the spot thus denuded of its superficial covering rapidly runs on into ulceration. Such an ulcer may no doubt be aggravated by the presence of rough teeth, but they have no share in causing it, nor would it be much improved if they were removed. We may, therefore, dismiss this form of ulceration from our consideration, and turn to others which more immediately concern us.

The other two classes of ulcerative disease that I have named—the simple, or dyspeptic, and the syphilitic—may be determined by some fault of the teeth, and may, to a greater or less extent, be removed by the skill of the dentist. Do not misunderstand me. I do not, of course, say that a syphilitic ulcer, or even a dyspeptic one, can be *caused* by the state of the teeth. No amount of accumulated tartar, no rough edges or sharp points, could effect this. But, given a dyspeptic state of the stomach and of the parts in sympathy therewith, or given that faulty condition of the blood which we call constitutional syphilis, then the presence of a carious tooth may determine the outbreak of an ulcer, or may tend to keep it up and aggravate it. When the general health is good it is remarkable how very tolerant the tongue is of irritations. A whole row of irregular teeth is not enough to produce an abrasion. But let the patient fall into ill health, and then the surface is easily inflamed, and the inflammation quickly runs on into ulceration.

The simple or dyspeptic ulcers are most apt to occur in persons of a full habit of body, who have usually a bright, florid congestion of the tongue, and who habitually eat and drink freely. Such ulcers are generally situated upon the sides and under-surface of the tip, but not unfrequently they are found in the folds of the frænum. It is necessary, therefore that a careful search should

be made for them. This spatula, which I devised for my own use, facilitates both the examination of the under-surface of the organ, and the performance of operations in the sublingual space.



Dyspeptic ulcers are shallow; their bases are flat, and covered with a greyish slough; their edges are rounded and bevelled; they are encircled by an inflamed margin; they are very sensitive to the touch, and painful when the organ is moved; they are often multiple; they run an acute course, and, though successive ulcers may keep coming up for a length of time, no single ulcer lasts more than two or three weeks. Such are the characters of simple or dyspeptic ulcers. But if such an ulcer is brought on (as it very often is) by the irritation of a carious tooth, its appearance and its history may be considerably modified. The importance of examining into the cause of such an ulcer, to see if it depends upon some local source of irritation, is pointed out by Hippocrates, and enforced by Celsus. "When there is a chronic sore on the side of the tongue," says the former, "the surgeon should examine

whether it be not occasioned by the sharp point of a tooth." The offending tooth may be either in the upper or lower jaw. Sometimes a rough edge in the lower jaw irritates the tongue as it lies at rest. Sometimes it comes in contact with a sharp point in the upper jaw in every movement that it makes. At first that portion of the tongue which is irritated by the offending point becomes more vascular than usual, of a brighter red, and the papillæ are somewhat enlarged. If the irritation continues a slight circumscribed swelling arises, and subsequently the tissue softens, and a small ulcer is the result. After the irritation has lasted for a length of time, there may be more or less induration, which not unnaturally excites the fears of the patient. If appropriate treatment be not at once adopted, such ulcers get rapidly worse. They become foul, excavated, with irregular callous edges, and a hardened base. The tongue is furred, the breath is offensive, and it is evident that there is considerable derangement of the stomach. It is painful to move the tongue, and on this account speech is interfered with. If such an ulcer be neglected, it may lead to the most serious consequences, even determining the seat of a cancer. When there is a large, spreading ulcer in the tongue, when the lymphatic glands at its root are becoming indurated and enlarged as the result of the acute inflammation, and when the patient's

general health is failing, he must be considered to be in a position of great jeopardy. On the treatment which is then adopted it depends whether he is restored to health, or whether the disease assumes the clinical features of a malignant sore.

Leaving the dyspeptic ulcers, I now pass on to those which are of syphilitic origin. Syphilitic ulceration of the tongue may either be deep-seated or superficial. The deep ulceration is brought about by the softening and discharge of a gummy tumour in the substance of the organ; the superficial is commonly determined by some local source of irritation. The vertical cracks and fissures, which are so often seen on the sides of the tongue in those who have constitutional syphilis, follow the course, I imagine, of the folds into which the mucosa falls during movement; just as we often see eczematous rashes about the folds of the neck, or of the thighs, in infants. And in a similar way any other habitual pressure may lead to a superficial ulcer, and among such none is more common than the irritation caused by sharp or rough teeth, or by the fixings of artificial teeth. Here, then, we come once more into contact with the proper subject of this paper. The ulceration may remain superficial, of rather a chronic and indolent character, but exquisitely sensitive, so that the least touch causes the patient acute pain; or the base may become indurated, the surface excavated, the surrounding tissue inflamed, and the glands beneath

the jaw enlarged. Then the case approaches in appearance to the deep form of ulceration, arising from the discharge of a gummy tumour. Cases such as I have described, in which there is an excavated ulcer with thickening of the surrounding tissues, enlargement of the adjacent glands, and general cachexia, are sometimes very difficult to distinguish from cancer, and call for the most careful study on the part of the surgeon.

We may now consider the treatment of these various ulcerative affections; for the same general principles which are applicable to the dyspeptic ulcer are applicable also to the syphilitic. These principles are, — first, rest, — physiological and mechanical rest; second, proper local applications; third, suitable constitutional treatment.

But how are we to procure rest? First and foremost, by removing any local source of irritation; and here it is that the aid of the dentist is so valuable for the successful treatment of ulcers of the tongue; and it is upon this point more particularly that I hope to learn much from the members of the Odontological Society. Given an ulcer of the tongue, which is either clearly due to, or probably kept up by, the irritation of bad teeth, what is the best plan to adopt? Should such teeth be removed altogether, or should they be filled up or filed down? Or has the progress of modern dentistry devised any plan which may be better than either? These questions I shall not

attempt to answer myself. It would ill become me, before such an audience as this, to express any opinion. But I hope that they will be answered hereafter by those who are present, and that they may serve to draw forth the experience of the members of the Odontological Society with regard to tongue disease.

The local treatment of ulcers of the tongue may be summed up in a few words. The surface of the sore should be carefully, but thoroughly, touched with lunar caustic, and a soothing or cleansing mouth-wash prescribed. Nothing is better than a solution of chlorate of potash. At the same time the patient should be desired to abstain as much as possible from talking for a few days, until the ulcer has cicatrized. I find the diluted nitrate of silver (equal parts of nitrate of silver and nitrate of potash) very suitable for these cases. It is quite as potent a caustic as is required; it is less painful in its application than the pure nitrate of silver; and it is so hard that it can be cut to a fine point, and introduced to the bottom of cracks and fissures.

With regard to the constitutional treatment, it is of the first importance that the patient should live entirely upon a bland and fluid diet, avoiding all hard pieces of meat or bread, all pungent condiments, and everything that can irritate or inflame the morbidly sensitive organ. At the same time we must take care that he has plenty of

nourishment; he must not be allowed to fall below his usual standard of health. Some patients have such a dislike to be fed upon what are called *slops*, that it requires a good deal of tact and judgment on the part of their friends to get them to take their accustomed amount of nutriment in this form. Having laid down positive orders with regard to the general character of the diet, we then ask what can be done by medicines? If the ulcer is of the dyspeptic kind, we must first give alteratives—a little grey powder, or compound rhubarb powder, to stimulate the liver, and regulate the bowels, and this we speedily follow up with tonics. Among this class of drugs, none are better suited to the present purpose than the mineral acids and the preparations of bark. If the ulcer has a syphilitic origin, then a mild mercurial course, or the iodide of potassium, must be given in order to effect a cure. If the case is one of those in which the diagnosis is uncertain, and there is a serious fear of cancer, it is well to bring the patient speedily, but slightly, under the influence of mercury, and then two or three weeks will suffice to show whether any benefit may be expected from antisyphilitic remedies.

I pass on now to the second great class of diseases with which I said I should deal, namely, the cancerous.

Cancer of the tongue is a common, and a very

fatal affection. I have shown in my "Treatise on the Diseases of the Tongue," that, among surgical cancers of separate organs, it stands second in point of frequency, the first place being occupied by those of the breast. With regard to the fatality of lingual cancer, I have demonstrated, by comparing a large number of cases, that its average duration is only 57 weeks, *i.e.*, somewhat less than 14 months. I have, however, also shown that by judicious and timely interference by means of an operation, this period may be very considerably extended, and the condition of the patient moreover be rendered much more tolerable. To effect a cure is, I fear, almost beyond our power.

Cancer of the tongue begins either as a hard lump deeply placed in the substance of the organ, or as a pimple or vegetation on its surface.

When it begins superficially, it is worthy of notice how often its origin may be traced to some local irritation, such as the jagged edge of a tooth or the smoking of a short clay pipe. Indeed, there is no class of cancers which affords a stronger argument in favour of the local origin of malignant disease than these cancers of the tongue. If we could follow them all up to their source, I have no doubt we should find that the great majority occur in tongues that are already damaged from some cause or other.

When cancer has once attacked the tongue, no matter what may have been the exact mode of its invasion, its march is characterized by symptoms which are common to all its varieties. There is occasional darting pain, radiating towards the ear, temple, and vertex; the diseased portion is tender; eating is rendered difficult; speech is thick and indistinct; the base of the tongue becomes infiltrated, and the organ cannot be moved freely or protruded: it seems as if it were bound down to the floor of the mouth. The sublingual and submaxillary glands, as well as those which are connected with the lymphatic system, become enlarged and painful. There is an increased flow of saliva. The circulation through the brain is disturbed, and the patient complains of giddiness and headache. The cachexia now becomes more marked. Rapid wasting and loss of strength manifest themselves. The local disease gradually involves more and more of the tongue. Sometimes large sloughs occur in consequence of pressure upon the lingual artery or its branches, and profuse bleeding may take place. The difficulty of swallowing, and even of breathing, is great, on account of the obstruction which the disease causes at the pharynx; and this obstruction is increased by œdema, the result of retardation of the venous current. Sometimes the œdema is so great that the tongue is protruded from the mouth, and cannot be retracted.

Gradually the growth invades the neighbouring parts, and shows itself in the tonsils, the gums, and some other situations. Frequently there are affections of the air-passages,—*e.g.*, bronchitis or pneumonia,—and the scene closes upon one of the most painful cases that it is the duty of the surgeon to attend.

It is noteworthy, particularly in connection with the special subject of this paper, that cancer of the tongue always begins at or near one side of the organ. I have never seen a case (unless it arose out of that strange and rare disease *ichthyosis linguæ*) which did not fall under this rule. Indeed, so constant is it that it is taken as an aid to diagnosis when there is any difficulty in establishing the precise nature of the case. And sometimes in the early stage it is no easy matter for the surgeon to be certain with what he is dealing. A commencing cancer may be not unlike a simple hyperplasia, or a dyspeptic ulcer, or even a mucous tubercle. Nay more, any of these morbid states, which we are accustomed to regard as being in themselves far removed from epithelioma, may be so aggravated by local sources of irritation that in time they become truly malignant diseases. This is not the place to discuss the conversion of simple into malignant sores, and it would carry me beyond my proper subject if I were to do so. I may merely state my confident opinion that such a change often happens, and that

sores which are in their origin innocent, and which might by judicious treatment have been brought to a favourable issue, become malignant by protracted irritation and maltreatment.

Now, if cancer of the tongue be thus fatal, and if simple affections can be so irritated as to become malignant, how very important it is to remove such sources of irritation; and it is to effect this that the surgeon so often has to call in the aid of the dentist. When there is the slightest suspicion as to the nature of a sore on the tongue, there ought to be no hesitation, no half-measures. Any irregular teeth that may be at fault should be at once removed, and artificial teeth should be laid aside for a time. The patient should be ordered to abstain as much as possible from speaking, and to live entirely upon a liquid and bland diet. At the same time such medicine as the character of the sore may suggest should be prescribed—perhaps iodide of potassium, perhaps mercury, perhaps mere alteratives or tonics. If this line of treatment be pursued, it will soon be apparent whether the aid which the dentist can afford is of any avail, or whether the case must be dealt with by the operating surgeon.

Thus have I laid before you the commonest affections of the tongue which bring your branch of surgery and mine into contact. Other diseases of the tongue I have seen and read of, such as

ichthyosis or neuralgia, which may depend upon a carious state of the teeth, and the nervous impression conveyed therefrom. But these are comparatively rare affections, while those with which this paper is chiefly occupied are very common. I hope, therefore, that in the course which I have followed, I have chosen that which is most likely to lead to practical results, and to make this evening both pleasant and profitable by the mutual interchange of our experience.

Discussion.

Mr. C. S. Tomes had met with a case which, in connection with the paper they had just heard read, might be worth mentioning. It was a case of long-standing syphilis, in which the tongue, though not absolutely ulcerated, presented in a very marked degree those deep fissures which are met with in that disease. The patient was sent to him (Mr. Tomes) by the surgeon who was attending him to see if he could do anything for him to relieve the pain and annoyance experienced in eating, speaking, or anything necessitating movements of the tongue. On looking into the mouth no carious teeth were found, but the cusps of the lower molars were seen to be unusually developed and almost sharp when felt by the finger. These cusps were reduced until they presented no marked prominence, from which time the condition of the patient in respect to the tongue wonderfully improved. As the patient was taking remedies at the time, it could not be laid down as certain that the levelling of the prominent cusps was the sole cause of the improvement.

Mr. Sewell referred to a case known to Mr. Fairlie Clarke, which greatly resembled that just mentioned by Mr. C. S. Tomes. The patient had lost a first molar tooth of the lower jaw upon the right side, and had acquired a habit of rubbing his tongue against this uneven surface. As this naturally gave him great pain and annoyance, Mr. Sewell supplied him with a vulcanite plate highly polished, which proved to him of the greatest comfort. Cases of patients applying with ulcerated tongues due to sharp edges of carious teeth were almost of daily occurrence in their practice, and he felt the Society was much indebted to Mr. Fairlie Clarke for bringing the subject before them in so comprehensive and able a manner.

Mr. Coleman said there were many points in Mr. Fairlie Clarke's paper excellent for discussion, but very few open to contradiction. A point of interest in connection with the subject was the fact that patients often presented themselves stating how much their tongues had suffered from sharp or irregular edges of teeth, and when protruded exhibited nothing more than a slight enlargement of the papillæ and perhaps a little appearance of vascular congestion at the spot referred to. In his own case he had on more than one occasion looked for a distinct ulcer, and had found no more than the above. The very sensitive nature of the organ probably accounted for this. With regard to the difficulty in diagnosis in the various forms of ulcer met with in the tongue, he thought the syphilitic might often be eliminated by the circumstance that they were—at least, according to his experience—less painful than the ordinary irritable, dyspeptic ulcer, or that caused wholly mechanically. He quite agreed with the author of the paper that the greatest difficulty often existed in the diagnosis of a malignant ulcer at its very commencement, and believed with him that ulcers often benign in form at first assumed afterwards a malignant aspect; hence the great importance of at once removing, if possible, the cause of the simplest form of ulcer. Persons possessing what was commonly termed a cancerous diathesis, no doubt often passed through life without any condition arising to determine a malignant growth, which they well knew was so commonly attributed, by the patient at least, to an exciting cause,—a sharp edge of a tooth in the case of the tongue, or a blow on that part in the case of the breast. Mr. Fairlie Clarke had expressed a wish that some opinion should emanate from the meeting that might be adopted as a rule in regard to cases when teeth were the cause of injury and ulceration to the tongue. He could only offer his own opinion; and it would be that, in the case of loose teeth or roots, they should be certainly removed, unless the patient were in that extremely debilitated condition that the slightest shock or loss of blood might prove serious. Firm roots might either be filed smooth or removed, according to the condition of the patient. Carious teeth should be saved,

and the gold filling exhibited that evening by Dr. Chance, though not executed in the mouth, would show how a very irregular surface might be rendered even smoother than ordinary enamel. Sound but fractured teeth should be filed smooth, and the irregularities caused by the loss of teeth could be best met in the manner adopted by Mr. Sewell. He agreed with Mr. Sewell, that they owed a debt of gratitude to Mr. Fairlie Clarke for his paper, which was an addition to their literature on the subject.

Mr. DENNANT said that, whilst they had frequent opportunities for relieving cases such as had been mentioned in the paper of the evening, they must not forget they had the power of often preventing them altogether. He referred to those where the cause of the irritation was roughness or unevenness in the mechanical appliances supplied to patients. When the bite had to be let down, it was very important that it should not be left square, especially on the lingual aspect, as was not unfrequently done, but should be carefully bevelled and polished. He believed it would be an advantage if the makers of teeth would contrive the first bicuspids to be smaller than the second, so that the lingual cusp should not form so great a prominence as was generally the case when flat incisors and canines were used. Under such circumstances he had invariably to reduce them. He had recently in his practice a very painful case occurring in a servant of a medical man at Brighton, for whom he had made a platinum denture. To relieve discomfort she had filed it herself, leaving a rough edge, which had excited the growth of a tumour of a suspicious, if not of a very serious, character.

Mr. MUMMERY thought they would do well to bear in mind a remark occurring in Mr. Fairlie Clarke's very excellent paper,—namely, the opportunities they often had of seeing diseases of the tongue, which might hereafter become unamenable to surgical skill at a time whilst they were manageable. A distressing case bearing upon this question came under his notice about two years since, in the person of a rector of a

parish, some forty miles distant from London. He had never consulted a dentist in his life, though his wife had been a patient of his for some years, and at her request he looked at his mouth. There was an ulcer having all the appearance of an epithelial cancer. He informed him that it had existed for some time and had been repeatedly cauterized with lunar caustic by his local medical practitioner. Anxious not to alarm him, but desirous of his obtaining the first advice, he pointed out how such a state of things must interfere with his duties as a clergyman, especially in reference to speaking; and prevailed upon him to consult an eminent surgeon, who at once informed him of the seriousness of his case. To prevent his biting the tongue, the speaker capped the teeth of the opposite side, which gave for the time great relief; at the same time rounded off the edges of the teeth on the affected side, which, as in the case described by Mr. C. S. Tomes, were very sharp on their lingual aspect. However, the tongue was removed as the last resource, and to the surprise of all, his articulation was comparatively not greatly impaired. The unfortunate gentleman did not however long survive the operation, secondary disease setting in in the glands of the neck. It was a sad case, for had the true condition of things been detected earlier, there was every reason to believe life might at least have been considerably prolonged.

Mr. Fairlie Clarke, in reply, said he had very few remarks to offer, further than to express the satisfaction he felt in what had fallen from the members of the Society during the discussion of his paper. The one or two questions he had ventured to raise had been answered to his entire satisfaction, and one or more suggestions had arisen which were new to him. Mr. Mummery had indicated several very interesting points: the fact that tongueless people could speak, was a very interesting one—he might say historically so. In his work upon diseases of the tongue it was touched upon: it was also referred to in Mr. Erickson's work; and it had likewise formed the subject of a larger work, in which cases of the kind had been collated. In the Middle Ages it was thought to be a

thing miraculous. Gibbon had also alluded to it. He had only to thank the Society for the way in which his paper had been received at their hands.

The PRESIDENT having thanked Mr. Fairlie Clarke for his paper, Dr. Chance for his communication, and the various donors to the Library and Museum for their gifts, adjourned the Society to Monday, the 1st of December, when a paper will be read by Mr. W. A. Hunt, of Yeovil.

[The Editor regrets that the communication of Mr. Charles Rogers in the June No .of the "Transactions" should have been attributed to Mr. Looker, of Kingston, the maker of the tiles referred to in the communication.—ED. TRANS. ODONT. SOC.]

GENERAL MONTHLY MEETING.

Monday, December 1, 1873.

ISAAC SHEFFIELD, Esq., President, in the Chair.

The Minutes of the previous Meeting were read and confirmed.

The following gentlemen were nominated for Membership of the Society :—

Mr. William Edward Harding, L.D.S., 28, Castle Street, Shrewsbury, non-resident.

Mr. Thomas S. Muridge, D.D.S., 80, Brook Street, London, resident.

Dr. Barnham, New York, was elected an Honorary Member of the Society.

Mr. Harding referring to the communication of Dr. Chance on the subject of gold-pointed pluggers, made at the last meeting said, that after seeing Dr. Chance operate upon a patient at the Dental Hospital, he was still somewhat sceptical as to the superiority of those instruments over the serrated steel ones. After discussing the matter with Mr. Sercombe, it was agreed each to fill a cavity, Mr. Sercombe with the gold points, and he with the steel ones, and submit their results to Mr. Makins for examination. With the above two plugs, two more, made previously, with steel-pointed instruments, by himself, Nos. 3 and 4, were sent to Mr. Makins. As numbers only were attached to the specimens, that gentleman had no

knowledge as to how they were prepared. The following is Mr. Makins' report: the plug No. 1 was that made with the gold points, and No. 2 that made with steel points in comparison with No. 1.

"Danesfield, *Nov.* 28, 1873.

"Dear Mr. Harding,—

"I have examined the two stoppings you sent me, and also the two separated plugs. I made just sufficient cut into one end of each, to enable me to tear them apart without myself adding to their previous condensation by so doing.

"Between the two contained in the teeth, there is not a great difference, but what there is, is in favour of No. 1, which was fairly partially welded, and in which therefore the layers were not so reguarly separable; there are, however, as you will see, if you examine the portions, one or two distinct clear cavities in the plug.

"In No. 2 (also from a tooth) the welding was not quite so good, and the layers more traceable. Still both were quite sound and compact upon all external surfaces, and I should think you could hardly obtain, or indeed desire, better plugs.

"No. 3 was by no means so sound as the two first, and indeed, from the breaking up of it, appeared like a plug which had been introduced in two portions or stages.

"No. 4 was also very unsound, and the surface welding but shallow.

"I am pleased not to have known anything of these specimens beyond their having been manipulated by the two instruments. Looking at the subject critically, I should at once give the preference to the gold instrument, for it is curious what small influences affect and modify such a delicate result as molecular union; but certainly in these specimens the difference is very small indeed, not more than may have been occasioned by the circumstances under which they were worked.

"I remain,

"Dear Mr. Harding,

"Yours very truly,

"George H. Makins."

Mr. SERCOMBE, after hearing the letter of Mr. Makins read for the first time, could not resist the temptation of expressing the opinion that better results could be obtained by using the gold points than by the steel ones, and he felt assured he might have obtained a better result with the specimen handed to Mr. Makins had he taken a little more care in its preparation—as much as Mr. Harding had in his ; it was done off-hand and somewhat carelessly, as Mr. Harding and Mr. Forsyth, who witnessed it, could testify. He would have great pleasure in repeating the experiment with more care and in allowing it to be examined by Mr. Makins. He had been very favourably impressed by the unpretending and unostentatious manner in which Dr. Chance had brought the matter before them : he had exhibited no desire to press his invention unduly upon their notice, and had expressed his opinion that, having brought it fairly before the profession in this country, it would after a fair trial be found to possess the advantages he claimed for it. The plan, certainly, in his (Mr. Sercombe's) opinion, would be a boon to their patients, and would secure a more cohesive mass than could be obtained by steel instruments.

Mr. HARDING, referring to the remark of Mr. Sercombe, that he had taken more pains in the preparation of his plug than that gentleman had, said that his was completed first.

Mr. SERCOMBE admitted the fact, but explained that he expended more time than Mr. Harding in securing retaining points, and did not commence packing so soon as that gentleman.

Mr. COLEMAN suggested that more reliable results would be obtained if the same individual prepared plugs by each process, and then submitted them to Mr. Makins for examination, and he would ask Mr. Sercombe, if he would kindly undertake to do so.

Mr. SERCOMBE having expressed his willingness to do as suggested by Mr. Coleman, made some further remarks upon the severe tests he had subjected fillings to made upon both methods. Those made with steel points could much more readily have portions scratched or raked from their surfaces than

could those made with the gold points; clearly showing the more cohesive quality of the latter.

Mr. HUNT said he would anticipate a portion of what he had to bring before them in his paper that evening, in at once exhibiting to them some of Dr. Chance's gold points, which had been improved since that gentleman communicated his opinions to the Society; they were made of an alloy of about 14-carat gold by Messrs. Mathew & Johnson, specially for the purpose, and supplied by Messrs. Coxeter. He produced a plug made with those points and afterwards passed through the flattening mill, which they would see represented in a thin plate of metal.

Mr. SERCOMBE would like to state that a great difficulty Dr. Chance had experienced—viz. in attaching his gold points securely to steel instruments—had been overcome in a very ingenious manner by his friend Mr. Hutchinson. The instruments exhibited by Mr. Hunt were produced under that arrangement.

The PRESIDENT, in remarking that the preservation of the teeth formed the most important branch of their profession, said that it was a very great matter to secure instruments that would accomplish that object most effectually. He had not yet tried the gold-pointed instruments; he still adhered to the old-fashioned steel ones with smooth surfaces, and therefore was in no position to offer an opinion upon the efficacy of the former. To get a gold plug as dense as possible was the ultimatum of their desires, and if this could be accomplished best by the gold points, the sooner their use became general the better.

On Modern Advances in the Conservative Treatment of the Teeth. By Mr. W. A. Hunt, M.R.C.S., &c.

Mr. President and Gentlemen,—In complying with a request to prepare a paper for this evening, I have selected for my subject some of the various modern advances in the conservative treatment of teeth ; a subject deeply interesting to all engaged in the practice of oral surgery, which I am conscious I shall not be able to treat as its importance demands, and which, indeed, it would be a pleasure to me to see treated by abler hands.

Much new matter I shall not be able to bring before you ; some of you are far more competent to treat this matter than myself ; my wish is simply to give you all the practical information that I can, to excite discussion and elicit the opinion of the profession on certain modes of practice, and, gentlemen, stimulate that free interchange of thought between us which is one of the great duties of our Odontological Society. With this explanation I plunge *in medias res*.

In the first place, time will not permit me to answer the question that often presents itself, whether or not we shall attempt to save a given tooth. A leading statesman once said, "Gentlemen, there are three courses open to us ;" so in

this instance: firstly, we may try and save the tooth; secondly, we may extract; and thirdly, we may, if we like, let it alone. Now I firmly believe that in the great majority of cases conservative treatment can be successfully carried out, if we are prepared to give sufficient time, care, and skill; but if we cannot carry out the proper treatment, either from want of time, patience, or skill, I as firmly believe that in the majority of cases we had better let the tooth alone, for I believe that a tooth will last longer, and be more useful if left to itself, than if a careless attempt has been made to save it. Every one who is dependent on artificial teeth, be they ever so skilfully made, will vividly appreciate the value of conservative treatment. We cannot, however, deny that in certain cases extraction is really a more conservative treatment than plugging.

Take, for example, a case in which the first and second bicuspides and the first molar are very much diseased approximatively, and there is also a very crowded maxilla with much lateral pressure, an attempt to save all would, unless the patient were constantly under our hands—and even then perhaps,—be rewarded with the loss of all three teeth.

Now the extraction of the second biscuspis would relieve the pressure of the crowded jaw, and by increased access enable the operator to plug the first bicuspis and the first molar far more

perfectly than he could otherwise have done. There are other cases which I have no doubt in practice occur to us all, when circumstances force upon us the conviction that from a present sacrifice we shall reap a future good.

Now we must admit that our art has made great progress in the method of preserving teeth. Formerly the fact that a tooth was aching or discharging a secretion from its pulp-chamber, or even that its pulp was exposed, was ample evidence for signing its death-warrant. Now it is well known that a tooth may pain acutely although its pulp is by no means bare, and that when the diseased dentine has been removed, the pain ceases, and it may be effectually plugged. I am persuaded that numbers of teeth have been, and are even now, so lost.

Again, teeth in which the pulps are exposed slightly, or even extensively, provided they be in a healthy condition, can, thanks to carbolic acid and the osteoplastics, be preserved for years in good working order.

Mr. Woodhouse, in June last, read a very interesting paper on this subject. As his paper is so recently in our memory, I will not say more than that my own experience fully bears out the value of the treatment he adopts; and indeed, I cannot remember a case where a healthy pulp exposed by accident, the excavator, or even disease, after careful excavation, failure has occurred, the exposed

spot having been well swabbed with carbolic acid and capped with oxychloride of zinc. I except a case of an upper second molar with exposed pulp, where, after this treatment, extraction became necessary from severe pain, evidently due to nodules of dentine formed in the substance of the pulp.

Again, take the cases of teeth in which, from long exposure or the irritation of caries, such morbid changes have taken place in the pulp that we cannot reasonably attempt to preserve its vitality; still in most of such cases conservative treatment can be successfully carried out.

A very usual practice was to put a stiff cap of some material, the nature of which was dictated chiefly by the fancy of the operator, such as lead, gold, tin, cork, gelatine, asbestos, &c., and then constructing a plug of gold or amalgam over this. A fine hole was then drilled through the neck of the tooth into the pulp-chamber, to allow exit for the products of decomposition from the dying pulp, and for the secretion that exuded from that portion which was yet alive. Or, perhaps, a gold tube was constructed in the plug, one extremity being in communication with the pulp-chamber, the other communicating with the cavity of the mouth for a like object.

We must not forget to mention also that in cases where there was a slight exposure of the pulp, and excavation was exceedingly painful, the late Mr. Harrison proposed running a drill through

the neck of the tooth and cutting the pulp across; then proceeding with the excavation, which was, by this means, rendered perfectly painless. These plans have succeeded well, and are now practised by many operators with success.

No doubt the best treatment for teeth in this semi-vital condition is the more radical method of extirpating the pulp to the apex of the root, either at once, or after its death has been accomplished by the local application of arsenic.

We must by no means regard this as a new method; we may, however, feel surprised that it is not more generally adopted; indeed, until the last few years, cases of fang-filling occurred sporadically in England, and at the present moment I believe that were the good results obtainable more appreciated, the practice would become far more general. Take a retrospect of the history of fang-filling. Mr. Tomes says this practice was foreshadowed by Ruspini as far back as 1797. Then in the first vol. of the "American Journal of Dental Science," I find an excellent article on the subject, published in 1850. The writer says that in 1831 "he had the pleasure of witnessing the extirpation of the pulp, and the filling of the fang to the apex of a central incisor in the mouth of a lady, by Dr. Hudson, of Philadelphia." He also states "that he had the opportunity of frequently seeing the tooth afterwards—that is, twenty years afterwards,—and

that, although somewhat discoloured, it still remained a serviceable tooth, the filling being as sound as when first put in." He states that the "success attending this operation led him to attempt the filling of four incisors for a gentleman in a similar manner, and that thirteen years afterwards they looked well, had never had any abscess or any irritation in their sockets."

Here then are results truly encouraging, more especially when we remember what great facilities we enjoy which were unknown to the operators of that day. The concluding remarks of this article I will quote because I believe they embody faithfully the experience of those who are now practising this procedure. He says: "I have filled a great many teeth in the fangs, and as far as my note-book furnished evidence of the results, eighty out of one hundred cases have been successful; and I am inclined to the belief that most of the failures have been owing to my imperfect performance of the operation rather than to a mistake in the propriety of the operation itself, for in those teeth which I *have* extracted some months afterwards I have found, *almost in every case*, either that the vessels were not entirely extirpated, or that my filling had not reached quite so far as it should."

The attention of the Society was called to the subject in 1865 by an excellent paper from Mr. Thomas Arnold Rogers, who fully discussed the

modus operandi, and illustrated his paper by seventeen instructive cases. His successes and his failures were alike recorded. None of those cases had, however, been under his observation for more than a year. It would be interesting to obtain statistics from a large number of collated cases as to the length of time a tooth by this treatment can be preserved in a condition to fairly perform its functions, so that we might be better acquainted with the life-history of such cases. I should much like to know the experience of gentlemen present on this point. My note-book contains about forty recorded cases, but none of which I have been able to watch more than five years.

A few of the teeth operated upon five years ago, at the present moment are perfectly healthy, and retain their colour. Others are quite comfortable, and the periosteum apparently healthy, although the teeth themselves are discoloured. Some of these cases have turned out complete failures, and the teeth had to be extracted.

I, at that time, was in the habit of drilling out the canal to a tolerably uniform diameter, and driving a wooden plug up in some cases, sometimes using gold and sometimes amalgam; with this latter material, although I have only used it in a few cases, I have never had a failure.

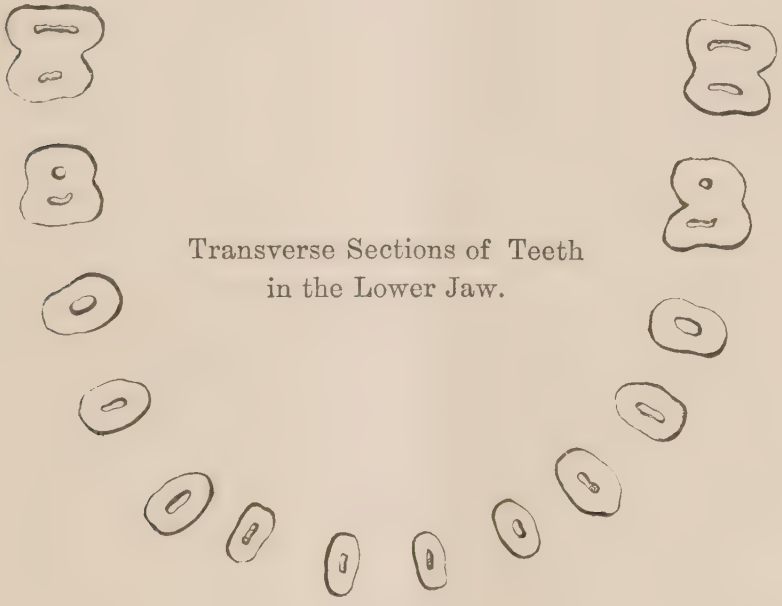
An ill-defined prejudice in my mind against amalgam is, I confess, the best reason I can offer

for not using it oftener for fang-filling. But latterly I have used, simply, cotton-wool soaked in carbolic acid; and after filling roots out of the mouth with various materials, cotton-wool seems by experiment best suited for the purpose. Some prefer driving up a cream of oxychloride of zinc, and no doubt it is a good plan. But looking at the success Professor Lister meets with in his wards by the use of carbolic acid for the destruction of septic germs, I cannot but feel strongly prejudiced in its favour. Those who were present at Professor Wood's address on surgery at the recent meeting of the British Medical Association, will remember that he spoke in a somewhat qualified manner of Professor Lister's antiseptic treatment of wounds, surgical and otherwise; but yet there is the stern logic of the excellent results of his treatment; nor do I prefer carbolized wool on theoretical grounds alone; I *know* the success that many men obtain by using it; and we all, I suppose, have had many an opportunity of witnessing the marvellous therapeutic value of carbolic acid.

The mechanical difficulties of perfectly removing the nerve and its accompaniments are often very great; and equally so the task of properly plugging the prepared canals.

Here are transverse sections of all the teeth in the lower jaw, with the exception of the third molars, whose development is usually so eccen-

tric that I have not put them within the circle. We are not often called upon to plug the roots of these teeth, and indeed in many cases extraction is the best treatment. These sections are all from different mouths, but are placed in the same relative positions as if they came from the same jaw: they are cut from ordinary teeth of adults, and are taken exactly transversely, just below the floor of the pulp-chamber; that is, just beyond where the points of our nerve-instruments enter, and therefore where our difficulties commence. I pass these round for your inspection; but I can more clearly show them to you by means of these diagrams.



Transverse Sections of Teeth in the Lower Jaw.

The posterior root of the molar running downwards and backwards, the canal being usually single, and more roomy, and somewhat cylin-

drical, is usually easier to treat than the anterior root, which runs downwards and forwards, and thus increases the difficulty of access. The sections of the anterior roots show the canal as a narrow slit; with expanded extremities; and here, as a rule, is the only place where there is room for the passage of an instrument: in some cases the space is not sufficient for the smallest instrument.

Sometimes a normally-shaped under molar with two roots presents four distinct tubular canals. Such a specimen I pass round, numbered 5. Then we come to the bicuspides and canines, the fangs are rarely double, the canals are nearly always roomy, and round, or else oval, more accessible than the molars, and altogether present fewer difficulties to the operator than any teeth in the series.

The transverse sections of the incisors present, proportionally to their size, a much larger and narrower oval than the bicuspides and canines. The incisors are so small that it often becomes a question whether an operator is justified in sacrificing the tissue necessary to enable him to gain access to the canals. Fortunately we are not often called upon to treat the pulps of these teeth, and the Hullihan operation is a second string to our bow, that in such a case we might be glad to avail ourselves of.

We will not stop here to inquire how best to

gain access to the canals of the lower teeth : free access there must be, however much tissue is sacrificed in obtaining it. Morrison's drill and a little ingenuity will sweep away a host of such difficulties. And here let me remark that I am averse to enlarging a canal if I can fill it without ; the drill, however well constructed, is liable to force septic matter through the apical foramen, or it may possibly leave the canal and run by the shortest course towards or even into the periosteum.

Having considered some of the difficulties in normal under teeth, let us not forget the increased difficulties presented by abnormal teeth. I pass round a few examples.

Nos. 1, 2, 3, and 4 are molars from the under jaw with three bold roots. No. 5 is a normal molar with two roots, but presents four distinct and separate canals.

Nos. 6, 7, and 8 are lower canines, with two and even three roots, with their respective canals.

No. 9 is a lower incisor with two roots.

No. 10, a lower bicuspis with two roots.

No. 11, a bicuspis with a large roomy round canal suddenly blocked with dentine for the lower half of its course.

No. 12 is a lower molar which had a large carious cavity, and presented the symptoms of pulp-inflammation, which had neither pulp-chamber nor nerve-canals.

All of the under molars which have three roots have the third root curved in a manner to prevent any operator from reaching the lower half of the canal in that root.

These deviations from the ordinary development should teach us to treat each case independently on its own merits, according to the conditions we find actually existing, and not according to the conditions we perhaps may naturally expect to meet with.

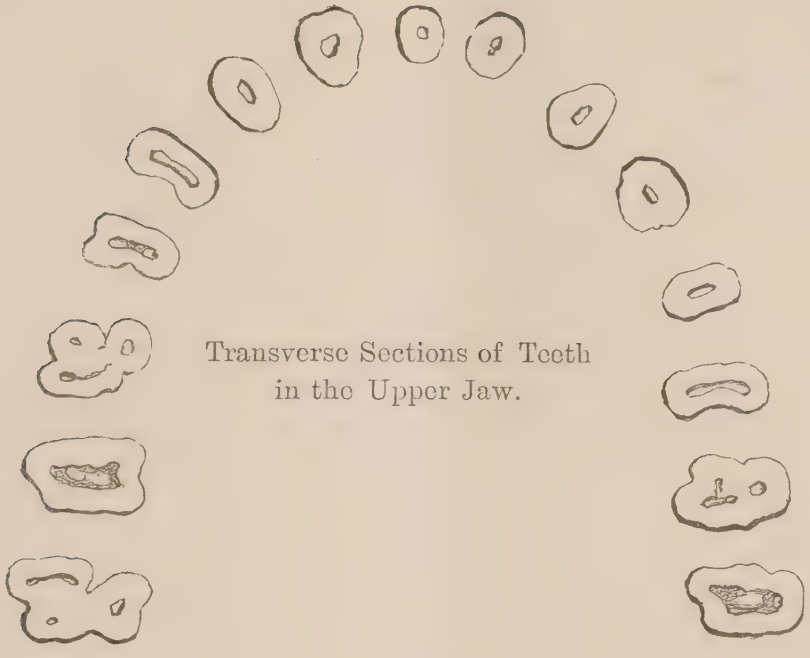
Here are transverse sections of the upper teeth, similarly selected as those we have been looking at in the under jaw; they are mounted on glass to exhibit both the crown and the root side of the sections.

The third molars are not shown.

Looking at these from the crown side, we see in the molars the rotundity of the canal in the palatal root in all four sections, and this is so con-

stant, and the root is commonly so straight, that the operation is conducted with great ease.

We notice also that the entrance to the canal in the anterior buccal root lies on a plane considerably external to that of the posterior buccal root. The entrances of the canals in both buccal roots are usually small and are overshadowed by



Transverse Sections of Teeth in the Upper Jaw.

a strong ledge of dentine: this dentine should be freely cut away, as it greatly impedes the operator.

The section of the first right molar seen from the crown side gives one the idea that it possesses small flattened buccal roots, but a section farther up shows an expansion into two large and boldly divergent roots.

The first right bicuspis shows a large long

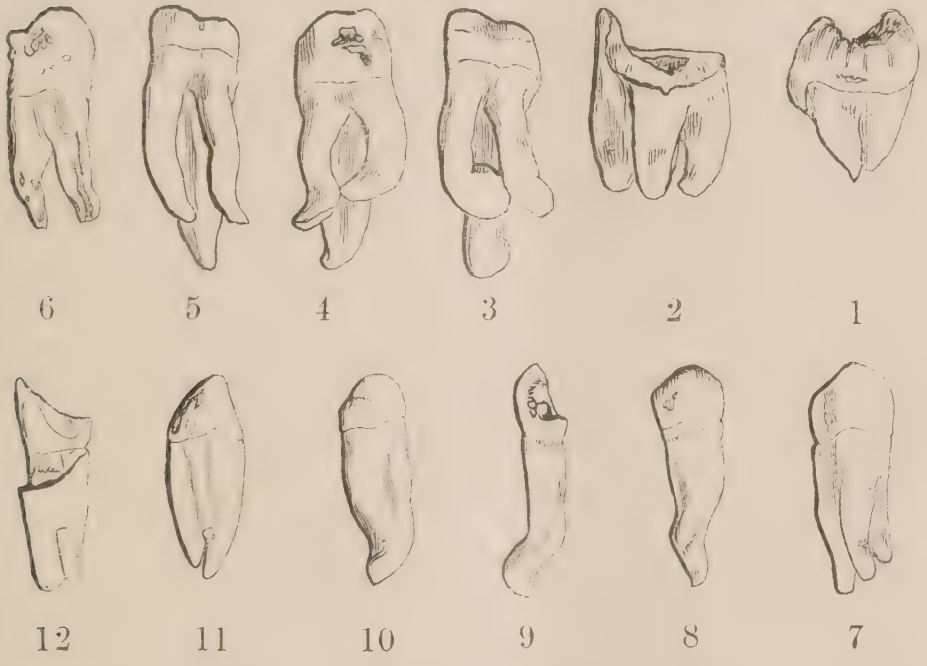
slit: this form the canal retains to the apex. The second right bicuspis shows a short oval slit: at the upper third of the canal it branched into two canals. The second left bicuspis shows a long oval slit, but on looking at the fang side of the specimen, a bridge of dentine is seen to divide the canal into two compartments.

The sections of the canines show an oval slit, and also show that the canal is most roomy on the labial side, which it is well to remember. The sections of the incisors show the canals to be irregularly round, but these are too well known to need mention here. I pass round for your inspection an upper molar with the canals laid open longitudinally, which well exhibits the ledge of dentine overhanging the two buccal roots.

Embarrassing deviations in form occur also in the upper teeth, of which I hand round a few examples. No. 1 is a third molar presenting roots much shorter than usual, and likely to mislead an operator who, perhaps, has just had a run of fang-filling in such teeth as the one numbered 5, where the roots are long.

No. 2 is also a third molar with three full-sized roots, all of which lie on the same plane. The posterior buccal root, or that root in the centre of the specimen, would probably escape treatment altogether, the operator being led to suppose that the two buccal roots were connate, and yet he would leave in this case the largest root of the three uncared for.

No. 3 is a case in which there is a secondary deposit round the apices of the fangs, a condition more frequently diagnosed after extraction than



before. Fang-filling would here probably result in failure, but such a case would furnish no evidence *per se* against the operation.

No. 4 is a molar in which the anterior buccal root presents a great curve, nearly forming a right angle: the posterior buccal root presents

two such curves. To my mind they present an insuperable obstacle to the passage of an instrument, although I have heard some operators affirm they can fill any root.

Nos. 6 and 7 are examples of upper bicuspides with three roots; this, however, is not uncommon, and when they are bold and divergent they are not difficult to fill, but when the three roots are small and indistinct, as in these two specimens, they are much more troublesome.

Nos. 8 and 9 are examples of bicuspides with the double curves I have just mentioned as occurring in the molar roots; No. 9 being a case where fang-filling in my hands was a failure, and I had to extract this specimen.

No. 10 is a canine which presents a double curve of a different description to the last, which is better seen than described.

No. 11 is an upper canine with two canals. The examples show, as I said before, the necessity of treating each case on its own merits, and not being too much guided by preconceived notions. If in each case we do our best, we shall not as a rule be disappointed if we find it impossible to introduce an instrument into any canal. We may often leave it without fear, and trust that Nature, who has meekly borne many an insult, will quietly submit to this; indeed, as a last illustrative case, I would draw your attention to No. 12, which is an upper right canine tooth. Here an energetic

dentist has been determined to obtain secure hold for his gold pivot, and carried his drill well through the side of the tooth into the socket, and has silked and fastened his gold pivot with gum-mastic *secundum artem*, into the jawbone itself. The patient, a middle-aged lady, wore this in comfort, at any rate with perfect freedom from pain, for nearly five months; when I saw her mouth I found the pivot tooth looking unsatisfactorily, and a little pus exuding near the neck. I persuaded her to let me extract it, which she reluctantly did, as she said she had had no inconvenience from it. Time, however, will not allow me to pursue this subject further.

Great advances have been made in the method of excavation. Dr. Morrison's drill is now so well known that it is not necessary to refer to it at length; thoughtfully worked out as its details are, there is yet room for improvement. The walls of cavities can by it be made beautifully perpendicular, and the smooth finish given to the interior of the cavity, and of still greater importance to its margins, greatly facilitates the introduction of the gold, and its more perfect adaptation to the walls. Nor is it likely that the operator's foot will always be the motive power; electro-magnetism has already been employed with some success, and in towns where houses are supplied with water at high pressure, on the system now acknowledged as the best, viz. the constant-supply system, I see

little difficulty in making water the motive power through the medium of a piston moving in a cylinder with large portholes.

The Keissler mirror is another aid. These glasses are constructed now of longer focus than they used to be: with a 4-inch focus they give an excellent, bright, and well-defined image. Here is one mounted on a handle; the place of the mirror stands three-quarters of an inch beyond that of the handle; so that the image is not intercepted

by the operator's fingers. This instrument is only for viewing the buccal aspects of teeth, for which it is admirably suited. It occupies very little room in the mouth, and by its means the commissure of the lips can be firmly held out of the operator's way. For this idea I am indebted to Mr. Greenfield.

Here is a mirror I have made for viewing difficult places; I believe it will be of value for examining inaccessible places in fissured palates, the posterior nares, &c.

The long stem is a rod of lead, which can instantly be bent according to circumstances, and will retain its new shape: if the stem becomes "fatigued" by frequent bending, it can at once be replaced by a fresh one.

The syringe is another aid: many good varieties

are procurable. The one I here show you has for years given me great aid. It remains in a tumbler of warm water, and is refilled by the time you are again ready to use it; you thus have a jet of water always ready, of a comfortable temperature: the inside of the cylinder is truly ground, so that the leather on the piston wears for years, and I have never known a drop of water pass the piston

so as to fall on a patient's dress. It is carefully manufactured by Messrs. Ash. This pattern I prefer, as the area of the piston is smaller, and it drives the jet, therefore, with greater force. Two of these syringes in a tumbler of cold water are sometimes very useful for syringing bleeding sockets, hardening gutta-percha, &c. Whilst one syringe is being emptied the other refills, and much valuable time is thus saved.

Great improvements have been made in the methods of keeping the saliva from the cavity. The rubber dam is certainly one of the greatest luxuries ever given to us. I had intended to have gone more fully into this subject, but time will not permit. Here is a lower maxilla. The dam is applied on the left side, but the holes are punched too near together, and it would therefore leak in a troublesome manner at the necks of the

teeth. I have passed a piece of string at the point where the dam does not fit. The holes should be punched about the distance apart that the centres of the crowns are, over which they pass: this has been done on the right side. The difference is obvious. I pass round a punch manufactured by Messrs. Ash, which will cut a *perfectly clean* hole in the rubber, an instrument which has long been needed. The left side shows a clamp of steel, plated with nickel, for holding the dam well down out of the way of the buccal aspect. These clamps are applied by a pair of diverging forceps which I hand round: they are very useful for either jaw, and are made also by Messrs. Ash; although we are indebted to men "across the Ferry" for the idea.

Here is another lower jaw, with a different plan for exposing the buccal aspect, and for keeping the dam well out of the way. A T-shaped washer of silver is passed between the teeth, and the ordinary wedge driven in upon it; the short arms of the T keep the dam down admirably, when it can be applied. We are indebted to the late Dr. Varney for this.

Here is another lower jaw, with a simple device for keeping the dam down round an isolated tooth, and keeping the lip away also. It is simply a double silk cord with a lead weight attached: this is wound twice round the neck of the tooth, and the weight keeps all snug, or, if that be not

sufficient, the patient can hold the weight in his hand and draw it down. To illustrate the dam properly would, however, require an entire evening.

Amadou and French blotting-paper are useful to dry the cavity ; perfection is, however, obtained by a hot-air blast, which there are several ways of producing. In December, 1871, I published a description of an automatic hot-blast syringe, in which a current of warm air was driven from the nozzle, and the instrument refilled by air passing down the piston-rod, which was hollow : thus the air travelled onwards only, and not backwards and forwards, losing much heat by so doing.

Mr. George Owen in October last published a description of a very perfect hot-blast instrument, in which the air was dried by passing over chloride of calcium.

Here is another form by Mr. Kirby: these are both made by Messrs. Ash. Here is an American pattern. I have here another form, simple and efficient: the part for heating the air is a coil of fine steam-pipe, through which heated coil the air passes to the nozzle, which is of ivory, a good

non-conductor of heat, from regard to the lip, &c. This can be directed to any point with steadiness by the right hand of the operator, whilst his left

hand works the elastic ball. I will by its means dry a wet spot upon this slate with rapidity.

Great advances have taken place in the mode of preparing gold for filling. The manufacturers now turn out beautifully-made cylinders and blocks: specimens of some forms of gold I hand round; and I am glad to be able to show you some manufactured by Messrs. Ash, which I have used with great satisfaction.

The increased activity of late years, in general education, and the more careful scientific training of all who enter our profession with any expectation of becoming competent practitioners, have led to a general demand for better instruments, and instrument-makers have been thus stimulated to bestow more care, skill, and study of detail than heretofore. I pass round a set of percussion pluggers, few in number, but well selected and very useful, after patterns by Mr. Mordaunt Stevens, late of the Dental Hospital, Soho Square; and soon I hope we shall be able to speak of the Dental Hospital in Soho Square no longer. Another set, according to the late Dr. Varney's pattern; a third set after patterns by Dr. Butler: the latter are nickel-plated, which is a decided improvement, especially for operators who have the misfortune to have a moist hand.

I also pass round two varieties of automatic mallets, one of which is a decidedly valuable instrument: they are of ingenious construction:

these are manufactured by Messrs. Ash. I also hand round a set of Dr. Byng's hand-pressure pluggers: all these will, I think, bear criticism; nor have I time to do more than just mention them. Dr. Chance's gold-pointed pluggers I also pass round.

The advances made in the wide field of gold plugging I must pass by unnoticed, for your patience must be exhausted; but if you think me worthy to expand this subject, I will do my best in a future paper.

I have thus hurriedly touched upon the most remarkable advances that have been made in the conservative treatment of the teeth. Let us all remember that the advance of the body corporate is dependent upon the vitality and growth of each of its members, and let each therefore contribute his share to this progression onward. And here let me quote the words of Dr. Baxter in relation to a society similar to our own. To us "our Society is an educational instrument in the widest sense, our only chance of culture; to nearly all of us dental surgery is not only an occupation, but a life. And in the recognition of this, — that our occupation and our life are one, lies at once the acknowledgment of our short-comings, and a ground of hope for further action. Stronger motives than those of mere ambition or curiosity stimulate us to exertions, which but for them would seem too hard. The mastery

over the past is of no avail, save inasmuch as it gives us a key to the future. We should be like those early voyagers, who, starting from their well-known home in some Northern island, were drawn ever onward by the vision of some mythic El Dorado or Fountain of Perpetual Youth: this indeed they never reached; but in their passage through warmer seas, into the atmosphere of the unknown, they were not left without reward, for every morning brought with it new horizons, every night new stars."

The PRESIDENT, after a pause of some minutes, said, as no gentleman appeared disposed to address the meeting or offer any observations upon the paper just read, he could only conclude that those present agreed entirely with its contents; he had therefore only to convey to Mr. Hunt the best thanks of the Society for the pains and care with which he had brought so important a subject before them.

Mr. VASEY was anxious that the author of the paper should fully understand that the absence of remark on the part of the meeting arose from the feeling that he had dealt so conclusively with the subjects treated upon that he had exhausted them. At the same time he thought there were many points in connection with Mr. Hunt's paper upon which opinions might be expressed, and hoped a portion of the time occupied at their annual meeting might be so employed.

Mr. HUNT thanked the Society for the kind attention they had given to his paper; as a country member he had felt some diffidence in addressing them, for he was well aware how much sooner all improvements and inventions became known to the London than to the provincial practitioner. He felt pleased to learn his paper was acceptable and his efforts were not unappreciated. He had also another thing to bring under their

notice, viz., a very ingenious dental bracket, devised by Dr. Morrison, and which he then exhibited to the members present. It consisted of a square table, containing drawers for gold, &c., placed at the end of a horizontal bar : this bar could readily be moved in any direction, and retained in place by a single thumbscrew. The bar was hollow and about two feet long, and contained spirit for the supply of a wick in the centre of the table. All the appointments were nickel-plated. The fact of its being devised by Dr. Morrison he thought sufficient apology for bringing it under their notice.

The PRESIDENT then, according to rule, nominated two members, Mr. Underwood and Mr. Fox, as auditors of the accounts for the past year, and adjourned the Society to the 12th of January, for holding the Annual General Meeting.

ANNUAL GENERAL MEETING.

Monday, January 12, 1874.

ISAAC SHEFFIELD, Esq., President, in the Chair.

The Minutes of the previous Meeting were read and confirmed.

The following gentlemen were nominated for Membership of the Society :—

Mr. James Stocken, 33, Euston Square, London, resident.

Mr. Samuel John Hayman, Smithfield Road, Cotham, Bristol, non-resident.

The following gentlemen were elected members of the Society :—

Mr. John Henry Phillips, 5, Cavendish Square, London, resident.

Mr. Augustus Cronin, 120, New Broad Street, London, resident.

Mr. Thomas J. Westall, 4, Courtenay Terrace, Devon Square, Newton Abbot, non-resident.

Mr. C. J. Wallis, Pau, Basses Pyrénées, non-resident.

A. L. Northrop, Esq., M.D., D.D.S., New York, non-resident.

J. H. Hitchcock, Esq., M.D., D.D.S., Boston, non-resident.

Mr. Thomas A. Rogers announced a presentation of excellent photographic drawings of microscopical sections of pathological preparations of teeth, from Dr. Hitchcock, of Boston. The Curator had kindly undertaken to have them mounted, with a description attached to each.

Mr. David Hepburn, Jun., presented from his father, Mr. Robert Hepburn, three sets of artificial teeth,—bone base, with gold pins, made in the years 1843, 1849, and 1855. The average wear of the pieces was six years each, and there was hardly perceptible any decay in either the bone base or natural teeth inserted. The specimens were interesting, as of work done in the periods named.

Mr. C. S. Tomes would bring before the notice of the Society an interesting model, showing a salivary calculus (the calculus itself), removed by Mr. Claude Rogers from the submaxillary duct of a patient at the Dental Hospital. The model had been prepared partly by wax impression and partly by modelling, by Mr. Hammond, a student at the hospital. A woodcut of the model was in course of preparation, and would shortly appear in the " Transactions."

He had also some models of regulation cases forwarded to him by Mr. Palmer, of Cheltenham. In all, the upper incisors closed behind the lower. Two of the cases were treated by silver plates ; the teeth were capped, and the incisors prolonged ; no ill results followed the use of the plates. One of the cases was treated by vulcanite plate, with pegs ; this was no less than eighteen months under treatment, but the patient had been very irregular in attendance.

He also exhibited, on behalf of Mr. Richardson, some abnormally formed teeth, one of which, a geminated tooth, having a third portion, or appendage, attached to it very firmly, but not by any calcified tissue. Also a peculiar example of exostosis, or, perhaps it might prove to be, a portion of a neighbouring tooth-fang very firmly attached by cementum.

Mr. Dennant.—A short time since, while visiting the museum of the Sussex County Hospital at Brighton, my attention was directed to this very remarkable pathological specimen. I at once thought that it would be an interesting object to the members of this Society, and solicited that I might be allowed to bring it up at one of its meetings for exhibition. I need hardly say that this request was very cordially complied with. I think you will agree with me that it is a very interesting specimen: the age of the child, the extent and growth of the osseous tumour, the skill of the surgeon, Mr. Jowers, of Brighton, the fact of being able to obtain eventually, after recovery, and subsequent death from another cause, the cranium with which to unite the specimen again, make it altogether a most unique case. The Curator, Mr. Blaker, has very kindly supplied me with some notes of the case, which I will read:—"Skull of a female child five months old, showing *in situ* a congenital bony tumour, which was removed at the age of six weeks. The child made a good recovery and left the Hospital, but died of pneumonia shortly afterwards. The child was under observation from within five days of it birth. During this time the tumour grew steadily and became harder, losing the pulsation which it seemed to have at first. The adaptation of the left facial bones subsequent to the operation, which conduced so much to remove the deformity, and the general growth during the same period, have rendered it impossible to replace the tumour exactly in its original position. But the flattened malar bone spread over the upper part of the tumour, and the alveolar process, with the sockets of some of the teeth, may be recognized. The tumour involves the whole of the right upper maxillary bone. It is formed of a mass of irregular roundish spiculæ diverging from a centre, the intervening space being filled up in the recent state with fibrous tissue and a little yellow oily matter. The bony structure is made up of short cancelli, and the bony cells generally are periosteal. The mass weighed in the recent state 2·25 oz. and measured 2·4 × 1·6 inches." Before resuming my seat, I would suggest to any gentlemen who may be visiting Brighton for the purpose of relaxation,

that they would be amply repaid by a visit to our Pathological Museum at the Sussex County Hospital. The building has recently been erected, and the whole arrangements completed under the care and presiding genius of the late Dr. Ormerod, and I am sure any member of this Society calling at the hospital will be very cordially received, and will pass an hour or two very pleasantly and profitably.

The PRESIDENT, having called upon the meeting to nominate six scrutineers, drew from the ballot-box the names of Mr. Dennant and Mr. Turner: the ballot was then declared open for one hour.

Mr. OAKLEY COLES exhibited some specimens of fine india-rubber tubing for covering spiral springs, to prevent abrasion of the cheeks, accumulation of food between the coils of the spirals, and to reduce the friction between springs and the sides of the teeth. The red specimens could be obtained of Messrs. Ash, and the uncoloured ones of Mr. Rutherford. Mr. Vanderpant suggested to him that the same means might be employed for protecting the spiral spring in Morrison's engine: it would not impair its efficacy and would prevent its interfering with the moustache of the patient.

Mr. COLEMAN could quite confirm the latter observation of Mr. Coles, for his machine, which he had had just a year, had its spiral spring covered with a piece of stout gas tubing, to save him the annoyance of continually having a bunch of hairs dragged out of his beard.

The LIBRARIAN, in response to a call from the President, said he had deferred his annual inspection of the Library until the Society occupied their new premises in Leicester Square, in order to make but one inspection after the removal. He had simply to state that the issue of books during the past year had been 96, as against 70 the year before. One volume was missing, viz., Garretson's *Oral Surgery*, and he would be glad if the member who borrowed it would return it to the Library.

The TREASURER said the financial statement * he had the pleasure of submitting to them, would, he felt sure, be a subject of congratulation to all. Such was the state of their finances, as audited on the 17th December last, showing an excess of receipts over expenditure to the amount of a hundred pounds.

With their permission he would, whilst on matters connected with his office, point out one or two things very simple in themselves, but evidently not very generally understood by the members at large, in consequence of which a considerable amount of unnecessary trouble was incurred by the officers of the Society. The first was in regard to the "Transactions" of the Society. The laws stated that no member should receive the "Transactions" whose subscriptions, due 1st November in each year, had not been paid. By the courtesy of the Council, however, the November and December numbers were sent to members whose subscriptions had not been paid for that year. He, the Secretary, the Editor, and the Publisher, were continually receiving letters asking why the "Transactions" had not been forwarded. The rule clearly offered the explanation, and he trusted members for the future would kindly bear it in mind. The next, though also a small matter, also often gave some trouble. Country members often sent cheques drawn upon country banks not having London agents; the result was they had to be sent down to those banks, and a commission was charged, causing both expense and delay, in acknowledging its receipt to the member. In such cases the remittance of a Post-Office Order would save both. He could not forbear on that occasion, alluding to the great loss the Society had sustained in the death of his predecessor in office, Mr. Harrison. His great accuracy in accounts, and the clearness with which he kept them, had made the work for his successor smooth and comparatively easy.

The ballot having been closed, the scrutators retired, and upon their returning it was announced by the President that

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* Appended to the present No.—see page 73.

the following Officers and Council nominated were unanimously elected :—

President.—Edwin Sercombe, Esq.

Vice-Presidents.—Resident: Charles Vasey, Esq.; Alfred Coleman, Esq.; John Tomes, Esq., F.R.S. Non-resident: Peter Orphoot, Esq. (Edinburgh); S. Clifford Gibbons, Esq. (Brighton); T. R. M. English, Esq. (Birmingham).

Treasurer.—James Parkinson, Esq.

Librarian.—Thomas A. Rogers, Esq.

Curator.—Charles S. Tomes, Esq.

Honorary Secretaries.—T. Henry G. Harding, Esq. (Council); Henry C. Sewell, Esq. (Society); Edwin F. Lane, Esq.—For Foreign Correspondence.

Councillors.—Resident: E. J. Winterbottom, Esq.; John B. Fletcher, Esq.; S. J. A. Salter, Esq. F.R.S.; James S. Turner, Esq.; Aaron G. Medwin, Esq.; T. C. White, Esq.; C. J. Fox, Esq.; J. O. Coles, Esq.; Edwin Saunders, Esq. Non-resident: J. K. Chisholm, Esq. (Edinburgh); Daniel Corbett, Esq. (Dublin); F. J. Clouston Scott, Esq. (Swansea); George Henry, Esq. (Hastings); G. W. Smith, Esq. (Manchester); E. P. Bromley, Esq. (Southampton).

The PRESIDENT then delivered his farewell address :—

GENTLEMEN,—The time has arrived when I must restore to your hands the trust which you did me the honour of reposing in me this time last year, and retire from a position which I can in all sincerity and truth designate as the proudest to which members of our profession can aspire.

Before, however, taking my leave of you as President of this Society, I will, with your permission, enter briefly on those matters of statistical detail which at this period of the year are laid before you, and which have an especial interest, as showing to what extent, financially and otherwise, this Society has

exhibited indications of increasing prosperity during the last twelve months.

And, gentlemen, I venture to predict, that, after listening to the remarks I am about to make, and in connection with the report you have just heard read, you will admit that in the universal march of progress so eminently characteristic of the age we live in, the Odontological Society of Great Britain has never been far from the van during the period in which it has been my pride to be its President.

And firstly, gentlemen, I will touch upon a matter which you will probably feel to be of primary importance. I refer to the financial position of the Society. Without the sinews of war, it is impossible, generally speaking, for any movement, however meritorious, to succeed; and I feel assured you were as gratified at hearing, as I was in inspecting, the balance-sheet of our worthy Treasurer, to whom and to our Secretaries I here take the opportunity of tendering my warmest thanks for the conscientious manner in which they have discharged their various and arduous duties. Last year, as perhaps you may remember, the balance in the hands of the Treasurer showed an income over expenditure of 3s. 2d. only, whereas *now* I feel the utmost pleasure in informing you that the balance this year shows a surplus of over £100.

I could hardly instance a more convincing proof of the advance of this Society, and a position, financially speaking, more encouraging, than this simple fact, especially as in all probability a demand of some amount will have to be made upon our resources, owing to our immediate removal from this room, in which we have held so many happy, and I trust instructive meetings, to the premises in Leicester Square, which the building commitee believe will be found in every sense conducive to the comfort and convenience of the present members of the Society, and also provide for the accommodation of the increase which we hope may take place in our numbers.

I have now to tender my acknowledgments to those gentlemen who have favoured us with papers and communications during my tenure of office; but for two reasons I must refrain

from thanking them individually; viz., a fear of trespassing unduly upon your time, and the recent illness and death of my brother, which has called me much of late to the North of England, and has prevented me from devoting as much of my time and attention to the subject as I could have wished.

My brother, as you will remember, although one of our profession, was not a member of this Society, in which, however, he took the liveliest interest, and who would no doubt have enrolled his name amongst us had he not been stricken down for the last twenty years by the hand of disease.

I must also for the same reasons abstain from making any further acknowledgments than by now offering my sincere thanks to those gentlemen who have so kindly contributed to our library and museum.

To those gentlemen also, who have presented to this Society instruments, &c., designed for the facilitation of the exercise of our profession, I can but briefly offer thanks on behalf of the Society and myself; full notices of them have appeared in our "Transactions" and in the Dental journals.

Death, I regret to say, has been unusually busy amongst us. No less than six of our members have passed away during the last twelve months. Of these, the most prominent are, Messrs. Harrison, Martin, and Charles Rodway, of whom I should wish to say a few words.

Mr. Harrison, until within a short time of his death, was so constant in his attendance at our meetings, that he was well known to you all as a zealous friend and supporter of this Society; but only those who have been associated with him as its Council, can appreciate the amount of voluntary work he did on behalf of the Society: a good example of this will be found in the two Reports of the Nitrous Oxide Committee, the greater portion of which he drew up himself. As President, Vice-President, and Treasurer of this Society, as Surgeon to the Dental Hospital, member of the Board of Examiners of the Royal College of Surgeons, and Chairman of the Committee appointed by the licentiates in Dental Surgery.

to watch over their interests, he worked zealously and unselfishly, not only for the good of the Society, but for the welfare of the profession at large. Although we now miss his presence from amongst us with regret, we have, however, his works to remind us in future years of him, of whom it was said by another President of this Society, "Omne quod tangit ornat."

Mr. Martin, of Portsmouth, was a warm personal friend of most of those gentlemen to whom, I believe, belonged the credit of having organized this Society; although he never took any very active part in its proceedings, he was ever ready to help the more active workers with his name and purse, and this, indeed, to a very great extent.

In Mr. Rodway, of Torquay, we have to mourn the loss of a young practitioner of great promise. Brief though his career was, his gentlemanly and kindly bearing to his patients and friends had endeared him to a large circle.

I am extremely sorry I am not in a position to supply notices of the other three members whose loss we have to deplore.

Having thus, Gentlemen, laid before you our statistics as briefly as possible, and rendered an account of my stewardship to the best of my ability, there now remains to me nothing but the duty of bidding you, in my official capacity, farewell; and in doing so I trust you will permit me to make a few remarks on my own personal account.

When the first intimation of the honour proposed to be conferred upon me, was given me, I confess to having felt considerable diffidence as to my fitness for the Presidential chair; for not having taken a very prominent part in the meetings and discussions of the Society, although one of its oldest members, I anticipated, indeed, meeting with many difficulties and obstacles, which, to a man so distrustful of himself as I am, seemed insuperable. When I tell you, Gentlemen, that these difficulties, formidable as they appeared, have proved to have been pleasantly surmounted by the kindness and courteous co-operation of my brethren in the Council, you will readily believe how deep and sincere are the thanks which I now express to you, for the unvarying kindness, consideration, and

attention that I have received at your hands from the first moment of my occupation of this chair.

With reference to this, our wisdom is, as it appears to me, ever to bear in mind that "a house divided against itself cannot stand." It is the same with learned Societies. Where the officers are well seconded by the members in their efforts for the improvement of the profession or the science which is the object of the Society, the good anticipated will accrue.

Speaking from the experience of the past twelve months, I can assure you that it has been a source of happiness, as well as pride, to me, to have been so honourably connected with such harmonious associations, and the best wish that I can express for my able and talented successor, is that he may succeed to my good fortune in presiding over coadjutors so courteous, so attentive, and so *loyal.*

Mr. SERCOMBE.—Sir, in the absence of one who I believe intended to be here this evening, I venture to be allowed to discharge a duty which has never in the existence of the Society been a more agreeable one than it is on this occasion; namely, that of proposing a vote of thanks to the retiring President. Perhaps no one has a higher claim to this duty than he who is to succeed to the important position you are about to vacate, for no one is so deeply interested in the fact that under your rule the Society has enjoyed a year of uninterrupted peace, and is at this moment in a state of great prosperity.

Having attended nearly if not all the meetings of the Society during your year of office, I am in a position to say that your conduct in the chair has been marked by the utmost urbanity of manner and keen attention to the business of the Society, and that we must all feel that we made a very happy choice when we last year selected you to fill the important office of President of the Society.

I trust, Sir, your retirement from the chair will not be, as is too often practically the case, your withdrawal from the meetings of the Society, but that we may be in years to come often cheered by your presence amongst us.

I beg to propose a vote of thanks (which I am persuaded will be heartily responded to) to Mr. Sheffield for the admirable and efficient manner in which he has conducted the business of the Society during the past year.

Mr. Tomes.—I am very happy to second Mr. Sercombe's motion, although I have attended so few of the meetings under Mr. Sheffield's Presidency, that I hardly feel myself entitled to do so. The "Transactions" of the Society, however, have informed me that the past year has been one of great success and prosperity; and the balance-sheet read to-night shows that in one most important department—the financial—it has been eminently so.

The President.—Gentlemen, I certainly did not expect to have such an expression of kind feeling towards me, nor so high an estimate of my feeble efforts to discharge the duties of the post you conferred upon me. I really feel quite unable to acknowledge it in the manner which is due. I can only reiterate, that if I could have consulted and acted upon my own feelings when I was selected for this office, I certainly would gladly have stepped aside, and allowed another—and many there were far more competent than myself—to take this chair. I have done my best; that best has been but little, but it has been the result of my best efforts to discharge the duties incidental to the office. I can only thank you sincerely and heartily for your kindness and consideration, and for the courtesy I have always experienced, when I have come amongst you, either at the Council-table, or at the ordinary meetings. And let me here add that I shall not fail, if health be granted me, and circumstances permit, to take the hint that Mr. Sercombe has thrown out, and appear in my place as an ordinary member of the Society at each of its meetings, nor shall I cease to feel an increasing interest in its affairs, nor lose any opportunity that may present itself to promote its advancement to the best of my ability.

I desire, gentlemen, to thank you again most heartily.

Mr. Fairbank had much pleasure in proposing that the best thanks of the Society should be given to their esteemed

Treasurer, under whose control their finances were in so satisfactory a condition.

This proposition, carried by acclamation, was duly acknowledged by the Treasurer.

Votes of thanks to the Secretaries, other Officers, and Council, were proposed and carried unanimously.

The PRESIDENT said it now only remained for him to thank Mr. Dennant for his communication, and the various contributors for their donations, and to adjourn the meeting to the 2nd February, when, under a new Presidency, he wished it every success and prosperity.

The Treasurer in Account with THE ODONTOLOGICAL SOCIETY *of Great Britain.*

Financial Statement for the Year ending October 31, 1873.

DR.	£	*s.*	*d.*
To Entrance Fees	29	8	0
Annual Subscriptions	337	1	0
Arrears	17	17	0
Sale of "Transactions"	20	9	1
Dividends on Stock	22	8	8
Interest on Deposit Note	6	19	2
Deposit Note	200	0	0
Balance at Bank end of October, 1872	97	16	6
	£731	19	5

CR.	£	*s.*	*d.*
By Rent	50	0	0
Wyman's (Printers)	179	3	0
Postage	7	2	3
Stationery	3	7	3
Library	17	19	7
Garner (Refreshments)	18	19	6
Illustrations of Dr. Murie's paper (balance)	14	17	0
Reporting	12	12	0
Petty Expenses	5	18	6
Dividends reinvested	22	8	8
Balance, as current account	166	11	4
In Treasurer's hands	33	0	4
Deposit Note	200	0	0
	£731	19	5

Total Receipts for the year 1872–73	£432	12	2
Disbursements	332	7	9
Receipts over Expenditure	£100	4	5

TOTAL ASSETS OF THE SOCIETY, 31ST OCTOBER, 1873.

Stock in the New 3 per Cents.	£777	3	7
Deposit Note	200	0	0
Cash at Bank	166	11	4
Petty Cash in Treasurer's hands	33	0	4
	£1,176	15	3

THOMAS UNDERWOOD,
CHARLES JAMES FOX, } *Auditors.*

ISAAC SHEFFIELD, *President.*
T. HENRY G. HARDING, *Hon. Sec.*

Statement of Elections, Deaths, Resignations, &c., of Members during the past Year.

Deaths	6
Resignations	1
Members elected.....	12
„ Honorary	3

Number of Subscribing Members (Resident)	86
„ „ „ „ (Non-resident).....	163
„ Honorary „	24
„ Corresponding „	20
Total.....	293

GENERAL MONTHLY MEETING.

Monday, February 2, 1874.

EDWIN SERCOMBE, Esq., President, in the Chair.

The President, upon taking the chair, said :—

Gentlemen,—You are aware that it is usual for the President to preface his year of office by a few introductory remarks ; but circumstances have suggested to the friends of the Society that on this occasion that rule should be departed from. You are all probably aware of the fact that we are expecting to move into new rooms. At the meeting of the Society last month it was announced that we should meet in our new rooms to-night. We could have done so, but it would have been very much to your discomfort. The walls are not sufficiently dry to justify our taking you there, and, at the last moment, we have decided upon holding this meeting here, and to defer our entrance upon our new rooms until our next meeting in March. It has been deemed desirable that the inaugural address, which is of a somewhat formal nature, should be delivered on that occasion, rather than on the present. I therefore crave your indulgence, if I at once proceed to the ordinary business of the Society, without making any further remarks ; but I may perhaps state that it is our hope to commence on that occasion our business at the usual hour of Eight, by one or two very interesting Casual Communications. I shall then venture to tax your patience for a short time, and we shall afterwards adjourn, the Dental Hospital, I believe, intending to

give a conversazione, which will afford us the opportunity of going over the various rooms which the Dental Hospital will use, and enable us to see the magnificent Museum belonging to the Society, the Library, &c. With these few remarks by way of explanation, I now call upon the Secretary to read the Minutes of the last meeting.

The Minutes of the previous meeting were read and confirmed.

Mr. F. H. Mummery, M.R.C.S., L.D.S., Cavendish Place, London, was nominated for Membership,—resident.

The following gentlemen were elected Members of the Society :—

Mr. Thomas S. Muridge, D.D.S., 80, Brook Street, resident.

Mr. William Edward Harding, L.D.S., 28, Castle Street, Shrewsbury, non-resident.

Mr. Isidore J. Lyons, M.R.C.S., &c., having signed the Obligation Book, was admitted a Member of the Society.

The Secretary then read the following Casual Communication :—

The Construction and Testing of Vulcanizers. By Mr. Thomas Fletcher, F.C.S.

No reliable data having been published as to the maximum bursting strain and safe working pressure of boilers of any definite shape and material for vulcanizing, I have taken the tensile strains as given in Molesworth's Engineering Formulæ, and calculated the minimum safe working thickness for cylindrical boilers 4 inches clear diameter, with hemispherical bottom. For boilers larger in diameter, 25 per cent. must be

added to the thickness of the plate for every inch increase in diameter, as will be seen from the following formula.

For ordinary quality rolled iron boiler plate, multiply the diameter of the boiler in inches by the maximum working pressure required in pounds on the square inch, and divide the product by 6,600. This will give the thickness of iron plate required in inches or parts of an inch. If we take as an example a boiler 4 inches diameter to work safely up to 200 lb. on the square inch—200 × 4 = 800, which, divided by 6,600, gives ·121, or almost exactly $\frac{1}{8}$ inch for a wrought-iron boiler.

The tensile strength of wrought copper is, as compared with iron, 33 to 60, and therefore, a wrought copper boiler to work safely up to 200 lb. must be $\frac{1}{4}$ inch thick, if of 4 inches diameter; and increase $\frac{1}{16}$th for each additional inch.

The following table gives the resistance to tensile strain of all metals likely to be used; but an extra allowance must always be made in cast-metal boilers on account of the risk of imperfections in the castings:—

Resistance to tensile strains in pounds per square inch.

Iron, wrought	60·000
„ Swedish	70·000
„ cast	19·000
Copper, wrought	33·000
„ cast	19·072
Gun-metal, cast	36·000
Brass, cast	17·978
„ wrought	49·000

It will be seen from the above that cast gun-metal is, weight for weight, stronger than wrought copper, and it has also the very great advantage of being much more rigid. Numbers of the boilers thrown out of use are so, not from want of theoretical strength, but from 'racking,' caused by want of sufficient rigidity.

Some twelve years ago, in conjunction with Mr. Planck of Manchester, I had a considerable amount of experience in the construction of a class of vulcanizing boiler sufficiently rigid to make a perfect face-to-face steam-tight joint without packing. These were cast gun-metal, and of two distinct classes; one capable of standing a bursting strain of about 150 lb. on the square inch; the other sufficiently strong to stand a bursting strain of 600 to 700 lb., if not more. The lighter make, although perfectly safe in use, became unserviceable after a few years, from strainings, in the face of the fact that the upper parts and flanges were enormously strong and rigid. Of these lighter boilers I believe not one is in use at the present time; but of the stronger make, of which the body was not less than $\frac{3}{8}$ and the flange and lid $\frac{1}{2}$ inch thick, I believe every one is in use at present, and as good in every respect as the day it was made. One of these has been in my own laboratory in constant use for nine or ten years, and is in every point fully as good as the first day it was used.

Having recently examined some wrought-copper boilers of American manufacture which had been in use two or three years, I found that the action on them had been very considerable, nearly one half the thickness of the bottom having been converted into sulphide of copper; and the boilers being only in the first instance very light, they had become dangerous. The advantage that wrought copper generally (but *not* always) tears, instead of flying to pieces, is something in its favour, still, to have an entire boiler projected at you is not much more satisfactory than having a piece only; or, as happened to a friend, almost in my presence, the bottom tore open whilst he was close to the boiler. The whole affair flew up to the ceiling and nearly descended on his head. In this case the pressure was considerably more than it ought to have been, and the boiler had a nearly flat bottom of less than half the thickness necessary for safety.

I believe that the present tendency to make boilers apparently ridiculously strong is a step decidedly in the right

direction, and as regards permanence, they will prove very much the more economical and satisfactory in the end than those made not much exceeding their theoretical working duty.

The testing of boilers has been frequently recommended, but this is not always an easy matter, if they have to be sent away for some days when likely to be wanted.

Where the boiler cannot be spared, if iron, knock the scale off and sound with a hammer for the thinnest place, which is generally a little out of the centre of the bottom. When the thinnest place is found, clean the metal to the face on both sides, to be sure no scale remains, and drill a hole through, the same size as an iron wire previously procured. This will at once prove the thickness of the metal, and the hole can be closed by riveting the wire into it. If brass or copper, proceed in the same way, but use a wire of the same metal as the boiler, to prevent risk of galvanic action.

The formula given above, with the comparative strengths of different metals in the table, will enable any one to satisfy himself of the condition of his boiler, and the working strain it will safely bear. In very thin wrought-copper boilers it will be better, not only to rivet the wire in, but to solder it tight with common soft solder.

P.S.—The absolute bursting strain is about five times what I have given, but all authorities on boiler-work lay it down as a law that no boiler should, under any circumstances, be worked under steam at more than one-fifth of its theoretical bursting strain, as it may be seriously injured and weakened by pressure far short of destruction.

Mr. Turner.—I can bear testimony, from sad experience, to the ripping-up quality of a wrought-copper boiler. I had in use an American boiler of wrought copper : the bottom of

it ripped open, and it performed similar antics to those described by Mr. Fletcher in his paper, as having happened to his friend's boiler. It went up to the ceiling and came down again; but worse than that, it threw a lot of plaster over the work-room and into the eyes of all present. That sort of thing is very unsatisfactory. It was the first time I had used the boiler. When I was in New York I spoke about it to the manager of Mr. White's establishment in that city, and he immediately said, "Well, I suppose the man who 'run' it, knew nothing about it." I did not say then that I knew nothing about it; but I was sorry to think that I had known nothing about it, for if I had known anything about it, I would not have used the boiler. There was a metal plug in the boiler, which was supposed to melt when a certain heat was reached, and there was a thermometer in the boiler, which was supposed to register the heat when it reached the proper vulcanizing point; and all I can say is, the thermometer did not reach the vulcanizing point, and the metal plug did not fuse; but the boiler gave out at the bottom, and when I spoke about it, that was all the satisfaction I received.

Mr. Coleman.—We have several matters coming before us to-night connected with the Casual Communication from Mr. Fletcher, but perhaps what I have to say will come better in at the present time than at any other. I wish to call the attention of the members of the Society to the new specimens of rubber which have been introduced by Mr. Turpin, of Paris. We have tried these, and find them very superior to any other specimens of rubber yet introduced. They are white, pink, red, and black. If members will take their pocket-knives and try them against any of the specimens, they will find how dense they are. I am informed that they require a little more care in vulcanizing; but when that difficulty is overcome, I think they will be found superior to anything that has been introduced, and in texture more closely resembling the bone of the hippopotamus than any other manufactured article. No special care has been taken with these specimens. They were vulcanized with some plates to-day.

Mr. Charles Tomes.—The difficulty, and consequent uncertainty, attendant upon filling the fangs of teeth with gold, or even with cotton-wool saturated with carbolic acid, has led me to adopt a slight modification of the plan ordinarily in use. I take a small platinum wire of such size as to loosely fit the canal, and pass it up to the apex of the root, which its great flexibility renders easy; it is then withdrawn and cut off to a suitable length, wrapped with the smallest possible quantity of wool, dipped in carbolic acid, and again passed up the fang, where it is left. This plan is not only easy of performance, but it has the advantage of positive certainty that you have passed the wire really up to the end of the fang, as the portion of wire left out will indicate how much has gone up the canal.

It is also useful in cases of old-standing alveolar abscess: thus a hole may be drilled in the lingual surface of a lateral or central incisor directly in a line with the pulp-canal, and the wire introduced; the original cavity of decay may then be filled, and the wire secured by tucking in its end, or by a little gutta-percha pressed around it. In the event of alveolar inflammation supervening, the wire can easily be removed by the patient, if out of reach of a dentist, and treatment applied through the drilled hole without interfering with the filling. I have had two very successful cases treated in this way lately: in each case I filled the cavities of decay on the patients' first visit, and the patients were, after the lapse of ten days, or thereabouts, obliged to remove the wires (which was done at the earliest indication of mischief). After a week or ten days' treatment the wires were again sealed in, and have now remained for several months.

The President.—We are under great obligations to Mr. Coleman for bringing those specimens of vulcanite before us. We all feel it very important to get vulcanite tougher than that we have hitherto used. Although the material has very much improved since we commenced using it, still we have not the material as tough as we could desire it to be, and any step towards increasing its toughness is a step in the right direc-

tion. Mr. Tomes's communication is a most practical one. We must all have felt great difficulty in dealing with those fang-fillings, and the success which he appears to have attained speaks very strongly in favour of the method he has introduced.

On a New Method of Manipulating Vulcanite.

By Mr. Caleb Williams, L.D.S.

Mr. President and Gentlemen,—In bringing before your notice the subject matter of this short paper, I must beg you to understand that my aim is simply to give a few practical details of a new way (as far as I know) of working vulcanite, so that you may test the plan for yourselves, and, I hope, bring before the Society the result of your experience.

The ordinary way of proceeding, as you are all aware, is to mount the teeth in wax; instead of this, I mount the teeth directly in the vulcanite; or, rather, I pack the rubber on the model before flasking.

You will observe that the model marked No. 1 is touched here and there with wax; the object of this is to make the rubber adhere to the plaster.

A piece of vulcanite is now cut to the size required, and heated on the ordinary hot-water plate, at the same time warming the model. When sufficiently hot, the vulcanite is pressed on the model with the thumb, and, as it comes in contact with the wax, melts it, and so is attached to the plaster. The superfluous rubber is then

trimmed off with a hot instrument, and a little wax is run round the edges to prevent the plaster finding its way under in flasking. The teeth are then mounted in the ordinary way as in wax, but they must be held in position while rubber is packed at the backs. After all the teeth are mounted, I find it advisable to melt a small quantity of wax round the necks of the teeth, and, in fact, everywhere where vulcanite adjoins the teeth or model. The vulcanite is now smoothed with a hot instrument; and it is as well to touch as little as possible the palate portion, so that it may retain the smooth surface with which it comes to us.

Strengthening pieces of gold may now be added—by being made hot and pressed into position—after the under surfaces have been roughened, or the vulcanite may be thickened at the weakest parts. The piece then has the appearance of models Nos. 2 and 3. It is now placed in the flask and the plaster poured in, great care being taken to leave no air-holes. The plaster is left to harden for ten minutes, and then the case may be vulcanized. It will come out like model No. 4. You will see that the wax has been absorbed by the plaster, and in its place is vulcanite. In this enlargement of the vulcanite lies the secret of success.

You will now see how necessary it is to exclude all air-cavities, for there is no pressure from

without, as in ordinary packing. Should there then be air-holes, the expanding power of the vulcanite is wasted in filling these, instead of taking the place of the wax, and failure is the result.

In this description I have taken upper cases only, but lower pieces are, if anything, easier to do; and, where a combination of gold and vulcanite is used, this method, to my mind, is far referable to the one in common use. Edentulous cases are perhaps easier to do in the ordinary way.

There is one disadvantage: it is that the cases are not so easily tried in the mouth, and in taking them off the model the vulcanite sometimes sticks so tightly, that it takes off a scale of plaster with it: this may, however, be avoided by only partially fixing the rubber until after the trying in is finished. Some of the advantages attending this method are these:—

There is little waste of material.

The teeth do not shift, as they sometimes do in the process of packing.

There is no danger of breaking the model or teeth by pressure.

If the model be good, there is a certainty of having a good fit.

There is much less trouble in filing and polishing, as there is so little superfluous rubber to be removed.

It is much cleaner than the other way, and the

piece can be left in any stage—a great consideration for those who have to leave every now and then to attend patients.

I must now thank you for your kind attention; and, I have only to add, that if there are any points where I have not made myself understood, I shall be happy to do my best to make them plain.

The PRESIDENT.—I may be allowed to suggest that, as the subject of this paper is related more or less to that which is about to follow, it would be advisable to defer the discussion until it has been read. By this arrangement we shall not only save time, but shall probably render the discussion more interesting. With your permission, therefore, I will call upon Mr. Turner to read the paper he has promised on Dr. Kingsley's recent method of making Obturators.

Dr. Kingsley's recent Method of making Obturators.

By Mr. James S. Turner, M.R.C.S., L.D.S., &c.

Mr. President and Gentlemen,—About a year ago I had the pleasure of listening to a lecture on this subject, delivered by Dr. Kingsley, of New York, at the Dental College of the Harvard University in Boston, Massachusetts.

In opening his address, the lecturer alluded to his visit to England, and to a conversation which took place between himself and Mr. Pollock, of St. George's Hospital, London, in reference to his then novel mode of treating defective palates. This method was, as we know, complicated and expensive, and Mr. Pollock, while admiring the beauty of the instrument, asked what could be done for poor people who could not afford the expensive apparatus, and among whom such cases are of frequent occurrence.

This question took possession of the Doctor's mind, and from that time he has given his attention to reducing his beautiful instrument to a more simple and manageable form. A few days after this, Mr. C. Tomes and I waited on Dr. Kingsley at his residence in New York. In order to meet us there, the Doctor had returned from Boston,

instead of continuing his journey westward, as had been previously arranged, an act of kindness which, although only one amongst many shown to us while in America, was much appreciated by Mr. C. Tomes and myself. In that interview he explained to us his method of procedure, and although it has been described in the handbooks of Dental mechanics, I have not seen it made so intelligible as it was made at this interview. I therefore gladly availed myself of the invitation of our President to bring the matter before you this evening.

The first point of simplification to which I would draw your attention is to the model of the defective mouth. This, as you are aware, was procured with considerable trouble and inconvenience both to patient and operator. The great idea being to obtain a representation of the region above the fissure, involving the inner walls of the turbinated bones and the anterior nares, according to the extent of the deficiencies of the case. The upper and posterior surfaces of both flaps of the split uvula, or the velum palate, were also considered necessary. This, as you will see, is no longer aimed at in the simple form of obturator now made by Dr. Kingsley. I ought to say here that I am adopting this mode of description for clearness and brevity's sake, and not with the idea of trying to show how the inventor arrived at his results. Here is a model such as would be

required by the original process, such an one as I figured a minute ago. Here is one required by the recent mode of treating such a case. What is obtained is the roof of the mouth, with a well-marked outline of the margins of the fissure. This is taken in plaster of Paris, and although not altogether void of difficulty (and I should like to know what is), is simplicity itself, compared with the first model shown. This model is subjected to a process of carving or trimming at the hands of the operator to make it fit for use. By using a small laryngoscope mirror, a view of the upper and posterior region of the fissure is obtained, and the corresponding parts of the model are trimmed away till a tolerable resemblance of the hidden parts is formed; yet such is the delicacy of the instrument now made, that the resemblance need not be nearly so correct as might be supposed, provided that the thickness of the margin be fairly approximated, and the parts which have been marked by the plaster be not interfered with.

The next thing to be done is to procure a wax (or if to be tried in the mouth, a gutta-percha) model of the desired obturator; and this also is very much simplified. You will observe that this wax model shows four surfaces. Two of them are free; that is they require no particular configuration for fitting purposes. But between these upper and under free surfaces are other two surfaces, which

may be called the middle surfaces, and they are connected by a neck or isthmus, more or less short, according to the thickness of the margins of the fissure in the model. These two surfaces and the neck are the only parts which call for special attention in the modelling: they must fit the model, inasmuch as they will be in contact with the living tissue. The pendent part of the obturator, which is really a continuation of the upper middle surface, ought to be tolerably neat and smooth. To procure this wax model easily, the plaster model may be broken in two, in order to relieve the wax without distorting it; and if thought desirable, the halves may be retained *in situ* by the model having been previously placed on a slab, although Dr. Kingsley is so apt that he does not seem to think this necessary. From this wax model a plaster mould is made, which gives a representation of the neck, the two middle surfaces, and the under and anterior surface of the pendent part of the projected obturator. This is what is meant by making the middle part first. This ring, or centre-piece, is made in one half of a round brass box of appropriate size and depth. It is, as you see, about three inches in diameter and three-quarters of an inch deep, inside measurement, the halves being held in position by two small projections or slips, and screwed together by bolts in the same way as an ordinary flask for vulcanite work. The wax model is placed

in the half of the box which has the square hole in it, a little wool or tow being placed in the hollow part, or palatine surface, to keep it steady and to arrest the flow of plaster, and the plaster is poured around it. The result is the ring already described. A duplicate of this is made in type metal, and when this is made you may, in the words of Dr. Kingsley, throw away your model.

You see we have now a clear representation of the surfaces of contact, and what is now wanted is to surround these surfaces with a substance, thin, smooth, elastic, and durable, so thin and elastic as to pass behind the margins of the fissure, and by its yielding nature rest with comfort to the patient on those surfaces of which there was only given a rude representation procured by trimming the original model from observations made through the means of a small mirror.

The next proceeding is to make the other two parts of the mould. This is done by a repetition of the process already described, each part being made in plaster first, and in type metal afterwards. To make the second plaster part, a thin piece of vulcanite modelling wax is laid over the surface of the middle ring, which gives the configuration of the upper middle surface, and of its continuation —the palatine surface of the pendent portion of the obturator. This, you observe, is the largest polished surface of the middle ring. The wax is trimmed exactly to the outline described by the

model on the cast, and made thin toward the edges. When the metal ring is placed *in situ* in the metal box, plaster is poured over it, and the other half of the box placed in position so that the plaster, when set, will fit it. In making this second part, place two pieces of string across the box to form a handle by which to withdraw the plaster. You will now see that the thickness of the upper wings, and the pendent part of the obturator, will depend entirely on the thickness of wax which you use in making the second plaster; and that if any part prove too thin when the obturator is made, this part of the mould may be scraped away to any required extent, as it has nothing to do with the fitting part. This is entirely confined to the centre ring. The third, or small part, is also made in the same way, and can also be altered to increase the palatine or lower wings of the obturator in thickness. When the mould of the second ring has been made in the sand, the iron pin which you see in the anterior part, and which is placed there for making a hole by which to attach the obturator to whatever mechanical arrangement may be adopted for retaining it in position, should be placed in the sand, so that the metal may be poured round it; but, if this be neglected, it can easily be screwed in afterwards. I now pass round those obturators, some made by Dr. Kingsley, and some by myself, also the metal moulds, a set of which, by

Dr. Kingsley's wish, shall be placed in our Museum; and, while you are examining them, I will repeat to you something of what the Doctor said as to their application.

When using them, he advises that they should be placed *in situ*, and a second impression of the mouth taken with the instrument in position in the mouth. He then leaves it to the judgment of the operator as to what shall be used to cover the more anterior or stationary part of the fissure, if there be one, for you will observe that he does not carry this obturator forward so far as he carries his more perfect instruments. In making this obturator Dr. Kingsley does not mean it to entirely supersede the original elaborate instruments, but he considers that their costly elaboration is not absolutely necessary. He also says that any one giving attention to these palatine deficiencies ought to be able to collect such a number of cases as shall be sufficient for him to keep a supply in stock, from which he could fit almost any model sent to him by any practitioner, who might write for such an instrument, without the trouble and expense of making one for his patient. This he showed possible by exhibiting a large stock, what seemed to me between one or two hundred obturators, such as you see here, and fitting them to models quite readily. This, he said, is his answer to the question of Mr. Pollock, that while he advocates each case having a special piece made for

it, yet, where money is a consideration, an obturator may be got ready-made quite sufficient for ordinary purposes. As a parallel case, he instanced the trade in ready-made boots, where, he said, you may get a very good and useful article, but yet we all prefer the boot that is made to our own last.

It is worthy of notice, that in the obturators which you are now looking at the pendent part is reflected upwards and backwards at its terminal margin. This is rather different to our preconceived notions, but the modification has been adopted by Dr. Kingsley after long years of experience. He finds the improvement in the voice greater than when the margin is left straight.

And now, Mr. President and Gentlemen, I might leave the matter here; but if you will allow me I would say a few words about making the metal moulds in which the rubber is cooked, as I am sure the process, though comparatively simple, requires some experience. The casting which is pursued in a dentist's workroom is usually of a very elementary character, one surface only being required, while the absolute smoothness of the model is held secondary to a general correctness of detail. In these moulds all the surfaces are required to be correct, and the parts which represent the obturator must be free from air-blows, and capable of receiving a good polish without reduction of surface by friction. The castings,

therefore, although solid, require to be conducted differently from our ordinary model-making.

The sand must be finer than that which we ordinarily use. Instead of the simple ring, must be used a casting-box of two pieces. To separate the halves of the mould, a parting sand must be employed. This is procured by heating the ordinary sand to redness; when it is cool, it presents that hard, granular, vitreous appearance, and makes a good dry separation to prevent the two sand surfaces uniting during the maleting of the second half of the mould. For a surface, Mr. Bennett recommended the use of rotten-stone instead of French chalk, or lycopodium, one of which is most generally used in the work-room for surface-making, and for lubricating the models. The gutter through which the metal is poured should be made deep and wide, not so much for the purpose of letting a mass of metal run into the mould at once, as to allow the free exit of air. When this cannot be done without trenching on the perfection of the cast, two extra gutters should be provided, opening on the cast as high as possible above the level of the essential part of the mould, which is, of course, that which represents the obturator. These gutters should be pressed quite smooth, and all angles removed, otherwise the metal in its passage into the mould is likely to carry with it grains of sand, which are almost sure to rest on some vital part, being

floated upward till they come to an expanded part of the mould, when the metal flows outwards, and they are attracted to the side of the mould, where they will form a hole, and destroy the casting.

As the type metal has to be poured at a high heat, the mould should be baked till quite dry, to prevent blows from moisture drawn from the sand by the hot metal.

The surfaces of the moulds on which the vulcanite is to be packed may be burnished, and then further smoothed by a cane and pumice, and finished off on the circular brush.

It is noticeable that the joins of the mould are all at the edges of the obturator, so that there is no seam, while the edges can easily be trimmed to any extent. The upper small part of the mould is held in its place by the square shoulder, which fits into the hole in the box or flask. Its edges can therefore be made round and free from the surface on which it rests, and so leave room for the escape of extra rubber. The packing is pursued as the appearance of the moulds would suggest,—the centre part first; then, when the two pieces are together, the pedicle or neck; then the upper part. The whole is then bound together by string, and placed in a pot of water, and boiled till all is thoroughly hot. A slight pressure between the jaws of a vice will bring the parts nearly together. The whole should then

be cooled in cold water, and the moulds taken to pieces. If the surfaces have all been well soaped, they will part readily, and the rubber pressed into shape can be removed, and superfluous parts trimmed away. This should be repeated till the parts are all close, when the vulcanizing may be proceeded with.

I may mention that these moulds, which go to the Museum were not made by Dr. Kingsley. He gave me what he had at hand when I made my hurried visit, but all the pieces did not belong to each other. I have made an entire series of plaster and metal moulds, also the wax and rubber obturator, so that the whole process may be studied together.

Discussion.

Mr. Vasey would like to ask Mr. Williams if he had noticed porosity in the vulcanite treated in the manner he had described. He had always believed that pressure was necessary in the process. On one occasion he had been shown, at a large vulcanite manufactory, a piece of baked rubber the thickness of his arm, upon which the manufacturer greatly prided himself: it had been subjected during vulcanization to a pressure of five or six tons, and yet the centre of that specimen for about an inch was quite porous. It was interesting to him to see those specimens produced in the manner described. Turning to the subject of Mr. Turner's paper, he had been favoured by that gentleman, upon his return from America, with a clear description of Dr. Kingsley's process. He had made many obturators, but those constructed by Dr. Kingsley far exceeded in perfection anything he had constructed. The process was very difficult to explain by description only—it required the actual witnessing of it to clearly comprehend it, and he would much like to see such a demonstration given, by some person who had worked at it, before the members of the Society. He was much interested in that portion of Mr. Turner's paper which referred to the cost of the obturators, and that it could be greatly lessened for the poor, as had been shown. He had tried to do what he could in that direction, but found the trouble in producing the first die was such that it quite equalled that involved in completing two complete sets of teeth, and the cost of the latter would be a fair one for the former. In the place of the casting-boxes described by Mr. Turner, he had employed plaster of Paris. He just covered it with a mixture of equal parts of plaster and sand, and into this, when well dried, he poured the metal. One of these casting-boxes was on the table for their inspection.

Mr. Weiss said, in the year 1861 he read a paper elsewhere on the subject of hardened india-rubber. The making of vulcanite pieces was then not only illustrated but fully discussed, and subsequent experience did not warrant his suggesting it

as an improvement upon what he was accustomed to do. When coloured rubbers were used there was little or no porosity, but in the case of black, unless it was vulcanised at a very low temperature, and subjected to very great pressure, a solid piece could not confidently be reckoned upon. In a block of ordinary pink rubber there was little or no expansion.

Mr. Oakley Coles felt that the dentists of this country were under great obligations to Dr. Norman Kingsley for the amount of labour he had bestowed in bringing these moulds to so great a perfection. The form of his instruments was in some respects similar to an instrument invented by Stearn, an English surgeon, many years back ; but to Dr. Kingsley was due the merit of constructing them in rubber. He (Mr. Coles) had had the opportunity of seeing some of Dr. Kingsley's earlier moulds : they were perfect pieces of sculpture, such as could only be produced by a master-hand. With reference to the precise form of instrument Mr. Turner had exhibited, he could not consider it of a novel character, as it was very similar to that Mr. Ramsay had constructed and described—that however was a minor matter. With regard to the question of cheapness—at least for hospital purposes—it was quite possible to meet most cases by the ready-made plan. The cases of cleft palate after a time repeated themselves, so that it was quite possible out of a large stock to fit the majority of them ; and having such a stock, he would be glad to place his moulds at the service of any member who might require a case in hospital practice. He felt they were not only indebted to Dr. Kingsley, but also to Mr. Turner, who had exhibited to them a series of moulds the nearest to perfection he had ever seen.

Mr. Coleman would ask Mr. Coles, as his experience in the employment of those instruments had probably been longer than that of any other member present, whether there was any tendency to enlargement of the cleft after they had been worn for some time. It appeared to him the chance of this might be greater when the instrument had not been made specially for the case. If there were any pressure upon the margins of

the cleft by that portion of the instrument which might be termed the central portion of the stud, it appeared to him almost certain such a result would follow. When a very elastic substance like sponge was used, the enlargement was very considerable; and there was in the museum of St. Bartholomew's a preparation showing this in the case of a woman, who, having commenced with a small piece of sponge, ultimately employed a piece which might have done for the ordinary domestic purposes of washing. The soft rubber might to a small extent act like the sponge.

Mr. Coles, in reference to the remarks of Mr. Coleman, would observe that he did not think it so desirable as Mr. Turner appeared to, that the sides of the cleft should be accurately fitted: when it did fit closely, you certainly did get a certain amount of absorption or irritation of the margins; whereas if the connecting portion of the two flanges were made smaller, you positively got in time a narrowing of the cleft. In a case where at 10 years of age a surgical operation would have been hardly possible, at 15, after wearing it, it had become quite practicable to do so.

Mr. C. S. Tomes.—The observations of Mr. Coles reminded him of an important question connected with this subject not touched upon by Mr. Turner. The operation of Staphyloraphy was at one time very largely performed at the Boston General Hospital, at the hands of Dr. Biglow and others, but especially the former, and the hospital had so great a reputation, that cases were sent to it from all parts of America. There were some peculiarities in the mode of operation they adopted: thus the patient was laid on one side, with the head rather below the rest of the body, and the operation was performed under the influence of an anæsthetic. By careful attention to a variety of details they attained the greatest surgical success possible; nevertheless, so good were the results of Kingley's obturators, that the operation had been quite discontinued, not one having been performed during the last two years: and not merely this, but some of the cases which had been operated on

were slit up again to receive Kingsley's obturators, because such infinitely better results as regarded speech and deglutition were thereby attained.

With regard to the observations of Mr. Coleman and Mr. Coles, he did not think there was a likelihood of those evil results occurring under Dr. Kingsley's hands; for when that gentleman was fitting some of his instruments to plaster models to illustrate their adaptability to different cases, he observed that he invariably selected one smaller than that he (Mr. Tomes) would have considered suitable to the case. The impression left on his mind was rather stronger than Mr. Turner had put it in reference to the question of adaptability; he rather inferred from what Dr. Kingsley told him, that he would now prefer adapting an instrument made from an old model to constructing it from a new one, and he showed him a large number of them strung together ready for application to any but a very extraordinary case. He had the opportunity of seeing one of them put into the mouth of a patient for the first time. It produced very little irritation or discomfort, and improvement in the voice was at once perceptible.

Mr. West would like to ask Mr. Turner if he could give any idea of the durability of those obturators; they appeared to him so thin and flexible as to be likely soon to wear away in the act of deglutition.

The President would venture to make one remark in respect to the comments of Mr. Coleman. He did not see how it would be possible for enlargement to take place in the fissure if the obturator fitted it accurately. If it impinged upon it, it no doubt would. The oldest case that he had had to deal with showed no such enlargement, although the instrument had been worn, fitting against the margins of the cleft, some twenty years. With a material like sponge, enlargement would rapidly take place. They all well knew how with cotton-wool they could separate the teeth; but with a material which did not sensibly expand, like hard vulcanite, he did not think there could be any fear if it fitted properly.

That there should be no pressure upon the margins of the cleft he had laid down as most important in a paper on the subject read before the Society during the first year of its existence. He would like to ask Mr. Tomes what success had attended those cases in which Dr. Biglow had slit up the velum united by surgical means. The results of the closure by surgical means had, according to his observations, been anything but successful in attaining the most important object in view; viz., a more distinct enunciation. This he attributed partly to the lessening of the oral cavity resulting from contraction of the cicatrices.

Mr. Tomes, in reply to the President, said that in one case he knew that a favourable result was obtained, but the velum was not slit up throughout its whole length. Both Dr. Biglow and Dr. Kingsley spoke about the improvement effected in it. In another case it was slit up throughout its whole length, but with what result he did not learn.

The President having called upon Mr. Williams and Mr. Turner to reply, the former gentleman said he had only to observe that in his process, where the vulcanite was of great thickness, it had a tendency to become porous. It was especially suited to palate cases where the vulcanite was thin and of one uniform thickness.

Mr. Turner, in reply, said that the want of analogy between a piece of india-rubber and a sponge continuously expanding with moisture, as pointed out by the President, was quite sufficient to answer the difficulty suggested by Mr. Coleman. When the margins of the cleft were pressed upon, they became abraded, and this had to be remedied. With regard to Dr. Kingsley's fitting the margins of the cleft accurately, he believed Mr. Tomes was perfectly right in stating that to adapt a ready-made instrument to a case, he always selected one which fitted loosely; in describing, however, how a process was to be carried out, it was necessary to give the description, as if the appliance constructed was to be a perfect and accurate fit. With reference to the mould-making, the

suggestion of Mr. Vasey was a very useful one, and were he about to go further into the matter, he should certainly feel inclined to adopt it in preference to that he had described. It was true you had to wait until the plaster was thoroughly dry, but it required more practice to manipulate the sand than the plaster and sand matrix.

In reply to the observation of Mr. West, he had put the same question to Dr. Kingsley, who remarked that you could make so many out of the same mould that the matter of durability was not worth considering: at the same time they lasted much longer in some mouths than in others, not so much from wearing out as from becoming offensive through collection of mucus. If baked too long—until they received a glazed surface—or even if kept for any great length of time, they were apt to become cracked.

The PRESIDENT suggested that they might be kept much longer by immersing them in a bottle of glycerine.

The PRESIDENT said, It is now my pleasing duty, in the name of the Society, to thank Mr. Caleb Williams and Mr. Turner respectively, for their papers; Mr. Fletcher for his communication, and Dr. Kingsley for a series of moulds illustrating his process for the treatment of cleft palate. I have already intimated to you that this is our last meeting in this place. All of you, no doubt, have felt what it is to leave an old abode, and start on a new career in life, and to have done so with sanguine hope, but nevertheless a heavy heart. I trust we leave this building grateful for the successful career we have run in it; but looking forward to a still more successful one, if that be possible, in our new Institution. That will be a noble monument of what this Society has achieved; for I certainly think we may regard the Dental Hospital as the offspring of this Society. But that future success, gentlemen, will depend upon yourselves; and I am sure you are all as anxious as I am that the Odontological Society of Great Britain shall hold its place foremost amongst the Learned Societies of this metropolis.

GENERAL MONTHLY MEETING.

Monday, March 2, 1874.

EDWIN SERCOMBE, Esq., President, in the Chair.

The Minutes of the previous Meeting were read and confirmed.

The following gentlemen were nominated for Membership of the Society :—

Mr. J. J. Holford, L.D.S., 14, Orchard Street, London, resident.

Mr. J. H. Longford, 13, Westmoreland Street, Dublin, non-resident.

Mr. G. Lydden, L.D.S., 16, Forbury, Reading, non-resident.

The following gentlemen were elected Members of the Society :—

Mr. James Stocken, 33, Euston Square, London, resident.

Mr. Samuel J. Hayman, Cotham, Bristol, non-resident.

Mr. W. E. Harding, of Shrewsbury, and Mr. W. Williamson, of Aberdeen, were admitted Members by the President.

The Curator announced the following Donations to the Museum, viz. : from—

Mr. E. P. Parkinson, tusk of a hippopotamus, and three walrus-tusks.

Mr. W. P. Bartlett, skulls of horse, donkey, and mule.

Mr. Clifford Eskell, skull of sus babirussa.

Mr. O'Meara, skull of a wild boar.

Purchased: Cast of Odontopteryx toliapicus.

Mr. Fox, Sequestrum, and all the teeth of the lower jaw, save the central incisors. (Models had previously been presented to the Society.)

Mr. Fletcher, malformed wisdom-tooth.

Mr. Francis Mason, small tumour removed from lower jaw.

Mr. Oakley Coles, models of the mouths of the "Kostroma people;" a series of six models of a case of V-shaped maxilla.

Dr. J. H. McQuillen, a model of an odontome.

E. Holborow King, Esq., specimen of exostosis and other abnormalities.

E. Brand, Esq., a very ancient sign-board containing a reference to tooth-drawing.

The President.—It is intended, in future, to give precedence to all casual communications of which notice has been given to the Council before the meeting of the Society. It is hoped that this arrangement will expedite business, and be a little more business-like. Acting on this principle, I now call upon Mr. C. S. Tomes for the first Casual Communication. We are suffering to-night from a disease not commonly known in our Society—*l'embarras de richesses*, but the order in which I received notice of the communications regulates my choice in selecting Mr. Mummery for the next and last.

Mr. Charles S. Tomes.—I have been asked to make a microscopical examination of the small tumour presented by Mr. Francis Mason. It is of the size of a cobnut, and was re-

moved from a woman, aged 22, a patient at St. Thomas's Hospital. It was attached by a very small pedicle between the first and second lower molar teeth, and lay between the cheek and the jaw. The pedicle was so slender that Mr. Mason wonders that the growth had not been rubbed off. It was so hard that he describes it as feeling "bony;" and adds that it appeared to spring from the periosteum. It commenced as a small nodule, and was twelve months in attaining to its present size; from first to last it was perfectly painless.

Its microscopical appearance is peculiar; it is a dense fibrous tumour, covered with an epithelium identical with that of the rest of the mouth—in fact, it precisely resembles a huge so-called "polypus of the gum," which ordinarily springs from the edge of the periosteum.

It owes its stony hardness to an abundance of calcareous matter; there is, however, no true bone, nor are there amorphous deposits of lime salts, but it is everywhere crowded with "calcorpherites;" those peculiar, onion-like bodies, which are formed where an insoluble salt of lime is gradually produced in a solution of a lime-salt in presence of organic matter, such as albumen or gelatine.

In conjunction with Mr. Oakley Coles, I have another matter to bring to your notice. We went together to look at the "Kostroma people," whose pictures you have seen about the street, the interest that they have for us in this Society being, that these hairy people are found either to be deficient in teeth or to have an excessive number of teeth. Several instances of the same thing have been recorded. In the Burmese Court there was a man whose whole body, with the exception of feet and hands, was covered with long, silky hair. He had no molars, and only a few incisors. By dint of bribery the King induced a woman to marry him, and the child reproduced the same state of things. When it grew to be an adult it developed hair all over its body, and though it had all the temporary teeth it had very few permanent teeth. By dint of bribery, once more, another woman was induced to marry this child, and a grandchild of the first hairy man was born, also hairy, and also deficient in teeth. In Turkey there is a dog

hairless, or nearly so, and presenting the same peculiarity of having very few teeth. Julia Pastrana was also hairy, with hair all over her face, and a very marked beard; she, however, had an excessive number of teeth. The history of the Kostroma man is this. From the traditions in the village near which he was found, he must be about 52 years of age, for about 52 years ago a hairy child was born, and lost sight of. After some time these Kostroma people were accidentally discovered in a neighbouring forest, about 800 miles from Moscow. They were living in a sort of cave, and probably fed on roots and whatever animals they could contrive to kill. This drawing is an accurate representation of the man, and is exactly like him. The hair is in some places longer than in others. In the ear, for instance, it is six inches long, and over his eyebrows it is so long that it has to be parted before he can see. The general appearance of the face reminds one strongly of a very hairy Skye terrier. He has a son who bids fair to be as hairy as himself, though as yet he is less so. He has fine soft white hair over the face, the father's hair being brown. In the Burmese cases the children did not develop their hair until they arrived at the age of puberty, and that was later than the normal period. This boy, then, will probably be nearly as hairy as the father now is. In the father's mouth there are only the remains of one tooth in the upper jaw, which has been described by Professor Virchow as canine, but which appeared to Mr. Oakley Coles and myself to be a lateral incisor. In the lower jaw there are the stumps of four teeth. The boy has a perfectly edentulous upper jaw, and in the lower jaw has four incisors only. The difference in size between the jaw of the boy and the jaw of the man is very slight indeed. Mr. Darwin has pointed out the correlation of growth which exists between hair and teeth; and it is very remarkable that this case, which was not known at the time Mr. Darwin published his remarks, should turn out entirely confirmatory of them. I need hardly say that a fresh case arising which confirms a generalization previously drawn, is very strong evidence of the truth of that generalization.

Mr. Sewell.—I am reminded that in the year 1870 I

showed a tumour to the Society very similar in character to the present specimen. In a large cavity, formed by the decayed crowns of a bicuspid and molar, there was a fleshy mass, in appearance like to what is known as polypus of the pulp. It was necessary that these decayed roots should be extracted. I proceeded first to remove the bicuspid, and with that came away this fleshy mass. It had no attachment to the gum. It was a well-defined lobulated tumour, attached to the periosteum of the bicuspid tooth only by a very small pedicle. If it had been pushed over between the jaw and the cheek it would have presented external characters exactly like those of the tumour which Mr. Tomes has described. The structure was not quite similar, being merely fibrous. I believe it was described in the "Transactions" of the year 1870.

Mr. Mummery.—Mr. President, when I had the honour some four years ago of reading a paper upon the supposed relations between caries in the teeth and the advance of civilization, I resolved that as far as in me lay, I would endeavour to place in the Museum of this Society, as complete a collection as could be obtained of ancient British skulls, or rather of the skulls of the various races who have in succession peopled these islands. The difficulty of achieving this is greater perhaps than would be generally imagined. Many of the much-talked of collection of skulls are of such dubious antiquity, that we really can gather no precise information respecting their date. The skulls at Hythe, for example, do doubtless possess a certain amount of antiquity, and I am told by a scientific friend of mine that a considerable proportion have been pronounced by a certain eminent Danish ethnologist, to be skulls of a Norse type, but whether of an earlier or a later period appears to be quite uncertain. Many theories have been advanced about them, but in all probability they are the relics of some of those roving Norsemen who used to commit predatory incursions upon the coasts of Kent, Sussex, Norfolk, and Suffolk. They have a certain amount of value, but we have no accurate record about them. They are evidently not skulls of the really ancient period of English ethnology, that is to say, not of the Stone Period; and although

there are barrows scattered over the whole of our chalk downs, throughout Hampshire, Wiltshire, Surrey, Kent, and Sussex, they have nearly all been pillaged in the hope of finding treasure, and as those who dug them up paid no attention whatever to the bones, the skulls have usually been completely crushed and destroyed. We can, consequently, but rarely learn anything from them. In the course of my search, I have had many skulls offered to me, which I could not accept because of their having no reliable pedigree, and I could not ascertain to what age they belonged. I felt it, therefore, a peculiar act of kindness on the part of Professor Rolleston, to whom I applied, when he said, "I will dig up a British man myself to ensure his being an authentic one." I may add that these ancient skulls, having lost their gelatine, are exceedingly fragile. They are usually so compressed and crushed by the superincumbent earth during the 3,000 or 4,000 years in which they have been interred, that it requires a great deal of skill to reconstruct a skull. This one consists of very many pieces which Professor Rolleston has most ingeniously put together. Unfortunately in the process of exhumation it has lost the left central incisor. With that exception, the dentition is perfect both in the upper and lower maxilla. I will now read to you the paper which accompanied this singularly fine skull.

Ancient British Skull, with lower Jaw, labelled "Wytham, 6–6–70."

This skull belonged to a skeleton found in the contracted position, the distance between the head and the knees being 21 inches, in a grave 8 feet deep, 10 feet long, 5 feet 6 inches broad, with the lower end of a flint hatchet and a pig's jaw between the chin and the patellæ, both of which were present. A considerable number of skeletons similarly buried have been obtained from the same burial-ground, which is near the village of Wytham, and about four miles from Oxford. The owner of this skull was a man, as the rest of his skeleton enables us to say, of considerable muscular strength, though in stature (5 ft. 6 in.) a little inferior to the average brachycephalic ancient Briton, whose skull-form, however, is most typically represented

by the one herewith presented to the Odontological Society. Having a very sincere regard for the Society, I take some pleasure in stating that I removed the skull, the skeleton, and the relics abovementioned myself, and that there can be, I apprehend, no doubt as to their authenticity and genuineness.

GEORGE ROLLESTON, M.D., F.R.S.,
Linacre Professor of Anatomy and Physiology, Oxford.

As there is much to be done this evening, I will not occupy many minutes by comments of my own, after the very comprehensive remarks which Professor Rolleston has given in that paper, but I may just say that this man of the Stone Period contrasts very favourably with a negro from the West Coast of Africa. It is true this modern negro is one of the very longest and narrowest skulls that has ever been measured. The British man had his teeth very much abraded, both in the upper and lower maxilla, but there is no symptom whatever of decay. The negro, on the other hand, had caries on the mesial approximal surface of the first bicuspides; he has lost the first permanent molar on the right side, and traces of alveolar abscess are also noticeable. These ancient Britons were doubtless people who lived mainly on animal food. They certainly were not agriculturists. They had no tools with which to till the ground. They had nothing but hard wood or flints lashed fast together by bark of trees, or what not, to handles. Such tools would, of course, be very imperfect agricultural implements; although, no doubt, they used these tools or weapons as tomahawks, and killed their fellow-men very abundantly. I have laid my plans for obtaining skulls of the old Britons who inhabited the western part of England, the dolicocephalic races — skulls almost as long and narrow as this negro skull, and of a type totally different from this brachycephalic skull. I hope before long to present an example of that form of skull to the Museum. In Yorkshire you sometimes find another type, and one in which the caries of the teeth is frequently met with. I found it occurring in about one skull in every five or six. Whether it was to be attributed to the water they drank, or to any other cause, they certainly suffered in a manner which the people of

the south or west did not. Among the Anglo-Saxons we find caries, but it had prevailed far more in the highly-civilized Romans than in the Anglo-Saxons, and, evidently, as the artificial modes of life increased, there was a greater amount of caries. At this period of the evening I will say no more, but I hope that ere long our special Museum will be enriched from every quarter, and that each member of this Society will feel it his bounden duty to add something to our collection; and then, under the able care of Mr. C. Tomes, whose ability is equalled by his zeal, I feel sure we ought to have a Museum second to none in London.

PRESIDENT'S INAUGURAL ADDRESS.

Gentlemen,—Deeply appreciating the honour your vote has conferred on me in placing me in this Chair,—the proudest position a man can hold in his own profession,—I hasten to offer you my profound and hearty thanks. I am not insensible of the responsibilities which are necessarily associated with this post; and I trust that I am not quite so ignorant of myself as not to feel how deficient I am in at least some of the qualities essential to a successful discharge of its duties.

Probably at no period since the foundation of this Society has the office of President been invested with more responsibility than on this occasion; and were it not for my knowledge of the loyal way in which the Society has at all times supported its chief officer, I should have shrunk from the position which your kindness has called me to fill. If I have not heeded that silent monitor which warns every man, if he will but hear it, of the dangers to which he is exposed from presumption, but have ventured to assume this duty, it is in reliance upon that generous spirit which has ever pervaded this Society; and in the belief that I shall have no unreasonable difficulty in guiding it safely through the year,

even though it prove to be one, as many anticipate, of more than usual importance. I can only promise to place my best abilities at your service, and trust that the year will be one of peace and prosperity.

There are moments in the existence of societies when it is well to pause and inquire whether their *raison d'être* has been justified; whether the objects originally aimed at in the formation have been kept in view, and have, to any satisfactory extent, been realized. The present appears to me to be an opportune moment in the history of the Odontological Society for such an examination.

In order that we may rightly understand the condition of Dental Surgery as well as the position of its professors in this country, and the need for such a Society as this, it is essential that I should take you back to a very remote period in the existence of our race. In doing so, happily, we do not encounter the difficulties which beset investigators in other remote subjects. With us nothing is left to conjecture. The records we have to read are not written in hieroglyphics, nor are they few and imperfect; neither, indeed, are they written on tablets that a few centuries can obliterate. Though it has been said of man's body, "Dust thou art, and unto dust shalt thou return," He who pronounced the sentence is slow to carry it into execution in its entirety; for the skull and teeth remain uninjured, and

almost unchanged, even when other parts of the body have for ages crumbled into dust. Where we find a skull with its teeth, there we have nearly all we require to tell us of the habits of the animal to whom it belonged; the diseases, if any, to which those organs were subject; and the sufferings incidental to them, or the immunity from suffering which their possessor enjoyed. As much cannot be said of any other organ; of the viscera not a wrack remains, — the solitary case discovered in Jutland, and described by Sir John Lubbock, * scarcely being an exception to this statement. When, in exploring a mound, we come upon a city of the dead, we cannot even conjecture whether its inhabitants suffered from any of those various forms of heart or brain disease with which, alas! we, in this age, are so painfully familiar. We cannot tell whether tuberculosis in some one of its varied forms decimated the land; while the more enduring parts of the body— the fragments of the skeleton that survive, are as silent as the grave from whence they have been dragged. Not so the skull and teeth; for though we may long in vain to know on what strange forms of animal and vegetable life the eyes gazed, that once filled those vacant sockets, or what sounds fell on those ears, or what thoughts of philosophy or of religion coursed through the brain, we can form

* "Prehistoric Times," p. 26.

some idea of the kind of food of which the individual partook, and thus, in some very remote degree, can infer the manner of life. For example, the Dolicocephalic Briton suffered much attrition of his teeth, due, probably, to his being a vegetarian; we, therefore, imagine him the opposite of the wiry, agile, cunning hunter: such a condition being scarcely consistent with a vegetable diet.

But I must not allow myself to be betrayed into the regions of speculation. I have already said that we are able, upon an examination of a skull and its teeth, to state whether those diseases—with which we are so painfully familiar, in these organs—were known amongst prehistoric men. There is no doubt but they were, in some degree; as, indeed, they are in this age known among nations that live in what is sometimes very euphemistically called "a state of nature." It cannot, however, I suppose, be denied, that disease in these organs bears some close relation to the civilization of man; but it must be admitted that among Brachycephalic tribes, — and we have no reason to suppose that they had advanced very far in a state of civilization—caries of the teeth was by no means uncommon. Mr. Mummery, a distinguished member of this Society, has, in an able paper, published in our "Transactions," thrown much light on this subject. He has found decayed teeth in many skulls, and evidence of alveolar abscess, frequent enough,

not only to comfort any one who desires comfort by knowing that his sufferings are experienced by others, but to satisfy us all that while, doubtless, we pay some heavy penalties for the pleasures of high civilization, they are not quite so heavy as some stoics would have us believe.

As we descend the stream of ages and reach historic times, we find in the earliest writings such allusions to the teeth as leave no manner of doubt of their being known as organs that could, if properly provoked, lead their possessors a very unquiet life. In the Book of Psalms we find the writer, when supplicating vengeance on the wicked, praying God, in wild, poetic language, to "break their teeth in their mouth;" as if that was the consummation of human suffering. We have evidence of disease of these organs being known amongst the ancient Egyptians; but I believe it is not until the time of Hippocrates that we find any very distinct allusion to such diseases. "His attention," says an eminent writer, "was attracted to every malady, and no symptom that accompanied disease was suffered to pass unnoticed or unexamined. Even those of the Teeth were made the subject of critical inquiry." In the palmy days of Greece and Rome, when the wealthy and the great were as luxurious as they are now, the teeth received their share of attention; probably, however, as much at least on account of the part they played in the beauty of

the face, as on account of their importance in relation to health.

We all know the power of Beauty, but who dare attempt to describe its triumphs or to depict its tyrannies? Has it not changed the course of empires? Has it not made and unmade dynasties? To write its history would be to write the history of the world. Was it not for his comeliness of person and beauty of face that Saul was chosen the first king of the Israelites? For similar reasons Daniel was chosen to stand near the King of Babylon. Has it not too often been from mere beauty of face that woman has been raised to a position that has enabled her to influence, and even to enslave, her admirer, so that to retain her favour he has been willing to part with his patrimony, even to the half of a kingdom? But how effectually bad, defective, or irregular teeth can mar a face otherwise most perfect, we all know. In that lyric Hebrew poem, the Song of Songs, we find the writer, when describing the beauty of his bride, saying, *inter alia*, "Thy teeth are like a flock of shorn sheep that come out of the water;" doubtless meaning thereby that they were clean, white, and regular; a condition essential to the ideal of youth and beauty. In the days of ancient Rome, when satire wore its keenest edge, these organs did not escape.*

* "But yet, Sertorius what I say disproves,
For though his Bibula is poor, he loves.

We find allusions in the works of Pliny, Martial, and other early Latin writers, to the use of powders for cleansing the teeth. It is even asserted that, in the sarcophagi of Egypt, traces are found to show that, in the days of the Pharoahs, dental deficiencies were supplied; and we know that among the ancient Egyptians one of the severest forms of punishment was the extraction of a front tooth.

From this necessarily very short and imperfect sketch we find that two distinct classes of men must, from the earliest times, have been engaged: the one in alleviating the suffering caused by diseased teeth; the other, in replacing the organ when lost from disease or accident. There would probably be little or no sympathy between these two: the one belonging to a class which, in the mythology of the Romans, descended from the gods; the other belonging to a class altogether inferior in social order. We have no evidence that the maker of artificial teeth aimed at any higher object than the restoration of those teeth

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True! but examine him; and, on my life,
You'll find he loves the Beauty, not the Wife.
Let but a wrinkle on her forehead rise,
And Time obscure the lustre of her eyes;
Let but the moisture leave her flaccid skin,
And her teeth blacken, and her cheeks grow thin;
And you shall hear the insulting freedman say,
'Pack up your trumpery, madam, and away!'"

GIFFORD.—*Juvenal, Sat.* vi.

which affected the personal appearance of his patron. He had not the happiness of feeling, as the mechanical dentist of the present day feels, that his work contributed in no small degree to the heath of his fellow-creature.

It is probable that the care of the teeth was in early times left almost wholly in the hands of the mechanician. The utmost the chirurgeon could do, so far as we know, was to attempt to remove a tooth when it caused insufferable pain. The operation was not an easy one; and, from the construction of instruments in use in even quite modern times—specimens of which were sent to the late International Exhibition by the College of Surgeons and our own Society—we may infer that, unless the tooth was allowed to become loose from successive attacks of inflammation, it was more often broken off than removed. The training of the mechanic would enable him to vie successfully with his more accomplished brother in the performance of this operation. In spite of the fact, that from the days of Hippocrates down to modern times, men of greater observation than their fellows wrote histories of the diseases of the teeth, and pointed out the important part they played, from almost the period of birth, in the animal economy, it became the fashion among medical men to affect profound ignorance on everything that related to these organs. Never-

theless, that prince of medical men, John Hunter, gave much attention to them, and wrote a most valuable treatise on the subject. Since his day, a slender line of men eminent for their physiological attainments, have devoted themselves more or less exclusively to the care of these organs. At the combined hospitals of St. Thomas's and Guy's, with all honour be it said, men have lectured on the teeth for about a century at least; and within the last twenty-five years every other Hospital in this metropolis has followed the example set by these older foundations. The object of these appointments has been no doubt to some extent gained, for medical students have acquired some knowledge of the diseases of the teeth, and have learnt to perform some of the simpler operations with an approach to dexterity. But the field of dental surgery having been practically vacated by the professional surgeon, it was left to any one to occupy it who felt disposed, and the laws of this country—never too restrictive—have not interfered with the liberty of the subject in this particular; for any one who has any aptitude, or imagines himself qualified, may assume to himself the title of "dentist," or "surgeon-dentist," whichever is thought most conducive to his success.

From what I have said it will be easy to perceive how the genus "dentist" of modern times sprang into being. His chief work being simply to supply artificial teeth, there was no great need of

any professional education. Manipulative dexterity being the primary requisite, under such circumstances it is not surprising that when a man of professional education devoted his attention to the diseases of the teeth, he drew as broad a line of demarcation as possible between himself and the men who called themselves dentists. Such an isolated position, and one so easily misunderstood by the outside world, was by no means attractive to a young man free to choose his own calling. Hence the cadets of the new profession were chiefly the sons of dentists who, endowed with gifts which in this country never fail to raise men above the level of their fellows, had opened up a road to large and lucrative practice. Such men naturally felt the importance of a thorough professional training. Daily experience of their own defects afforded them valuable help in directing the education of their sons. Beyond the valuable instruction which years of practice enabled them to impart, they sought therefore for their sons at the school of a general hospital that instruction in anatomy and physiology, in medicine and surgery, which they well knew was necessary to a man who wished to conduct his practice with credit to himself and with advantage to his patients. At the time of which I am speaking—forty years ago, the number of men who adopted this course was very small. Nevertheless a leaven was introduced, which has been gradually

leavening the whole lump. But of most of the men at that time calling themselves dentists, probably the less that is said the better. Dental surgery then was very much in the condition of a foundling, to be adopted by any one who thought he had an aptitude for it. Many were unfortunately tempted to enter its ranks, whose only desire was money-making. Their nefarious practices were virtually secure from exposure, because of the mystery in which, unhappily, many persons veiled their own dental defects. Charlatanism, like a fungus, thrives in the dark.

All this was injurious to the profession and to the public. Such men have given to the calling a bad repute, which the high character of many who now practise dentistry has not succeeded in entirely removing. There are yet to be found men, calling themselves dentists, who shrink not from advertising themselves in the daily press as capable of accomplishing that which at present human skill is utterly unable to accomplish; by their unblushing statements tempting numbers of the credulous into their houses, to find, when too late, that the man really to be trusted is modest in proclaiming his own qualifications. I may add, in the words of a recent review on dental surgery, "It is deplorable that journals of reputation can be induced to insert the specious and lying advertisements of such men as those to whom we refer."

Among the early English dentists, properly so called, who had received a good practical education, there was a point of union and a feeling of brotherhood; and I am told that within this coterie—for it was so small that it could scarcely be called more—a great deal of cordial intercourse and free hospitality existed. It would have been surprising if, on some of these occasions of pleasant intercourse, these gentlemen had not occasionally dwelt on the undignified place in general estimation then held by the art by which they so worthily made their own living; and it would also have been surprising if they had not been led to devise some means to remove this undeserved stigma. If in this matter tradition is to be believed, the first indications of a resolve to raise the status of dental surgery were post-prandial. There is something in the constitution of an Englishman which makes this period of the day the most fruitful in good deeds, and there appears to be no exception to this rule amongst ourselves; but without pursuing our investigations into this subject further, we may say, that the idea having been evolved, action in due time followed. A committee was formed, and, after much consultation, a number of men of high professional character were invited to unite to co-operate in some organisation; and thus the Odontological Society came into being.

And now, Gentlemen, for a more clear understanding of the necessity of this Society, let me focus my previous remarks. In the year 1850 there were about 1,500 persons, more or less earning their living in this country by the practice of dentistry. It is scarcely possible to conceive a wider range of personal and professional qualifications to exist among any 1,500 men, calling themselves by the same professional name, than that which existed amongst English dentists. Among them were to be found men whose writings may be regarded as among the professional classics of this or any other country, and at the opposite pole there were men who could scarcely read or write—so wide was the circle which dental surgery described. Within this circle were included members of the medical profession who might well be divided into two classes—those who adopted dental surgery from their sense of the importance of a knowledge of the principles of surgery and medicine in the treatment of many of the diseases to which these organs are subject, and who became in their own generation the instructors of their brethren in the purely medical and surgical departments of dental surgery; and those who adopted this branch of the profession only after having failed in general practice. Among the men who had no professional education were to be found some of the most accomplished practitioners of the day; men

endowed with natural gifts—without which the most highly-educated man will be as great a failure in dentistry as in the art of sculpture—but which, combined with a vigorous mind and a determination to overcome the deficiencies of early teaching, placed them finally in the forefront of their profession. From these we might descend through varying scales of professional ignorance, until we reached the class of utterly unqualified men who were dentists only in virtue of their own nomination.

This was the state of affairs when the Odontological Society was founded. In the words of the opening address delivered by our first President, dental surgery was at that time almost universally admitted to be "a well-defined speciality, at the same time too closely allied to general surgery to bear separation from it. The dentists of England ought therefore to look to the College of Surgeons for that examination which should test their fitness to practice." At the same time, it was felt by the founders of this Society that if dental surgery was a speciality requiring a special examination, it was necessary to provide a special school and special teachers.

Another reason for the formation of this Society I give, also in the words of the Inaugural Address, viz., "to provide a point of union amongst its members, where subjects interesting to the whole body of educated practitioners might be intro-

duced and fairly discussed for the mutual benefit of all, and through which the contributions of dental literature, at present scattered through the pages of medical journals, and often lost to those to whom they are most interesting, might be collected, so as to form both an instructive and valuable library for reference."

How far the Odontological Society has justified the hopes of its founders I will now proceed to discuss. Previous to its existence, the difficulty of obtaining a complete education in this branch of science was very great; each practitioner keeping his own method of manipulation a profound secret. Now the education is systematic and complete. A professional spirit is beginning to pervade the whole body. Even large numbers of men who have not joined the Society, are found conducting their practice in a professional spirit. None are admitted as members of the Society who advertise, and no member who is found to advertise is allowed to continue a member unless he discontinues the practice. The periodical gathering together of men for the discussion of subjects of interest, has resulted in a most liberal contribution of knowledge to the general store.

One of the earliest efforts of this Society was to induce the College of Surgeons to recognize, as the public had long done, and as probably each individual member of the Council of that College

had also long done, viz., that dental surgery was a well-defined speciality, and that a special examination was needed to test men's fitness to practise it. This was soon followed by an effort to establish a school of Dental Surgery. With anxiety and doubt, the house we have so recently left was taken and adapted, as far as possible, for the purpose of a Dental Hospital, and there, in spite of difficulties arising from the absence of light and of sufficient accommodation, the work has been carried on with a success, which I think the most cynical—if any such are to be found among us — must admit has far exceeded the most sanguine expectations of its founders. In fact, our very success has at last driven us out. This part of the programme of the founders of this Society may, therefore, be said to have been accomplished.

This, Gentlemen, leads me to speak of the event inaugurated this evening—the opening of these splendid premises for the purposes of the Dental Hospital, which, as you know, is the offspring of our Society, and with which we remain so intimately associated. For a long time every one has felt how inadequate our house in Soho Square was for the requirement of our rapidly growing school, but there was very great difficulty in the way of obtaining more suitable premises, and it appeared as if we should have to stay there until the end of our lease. I believe that, but for the

activity, intelligence, and munificence of one gentleman, such would have been the case. That gentleman, from the most disinterested motives, having nothing to gain or lose by the success or failure of the school, spent much time in exploring every neighbourhood likely to furnish a suitable site for the Hospital. At last he selected this, as on the whole the best that could be obtained, and as comprising all the points essential for a special hospital like ours. Without delay, at his own cost, he secured the building. When we were first invited to look at the dilapidated house,—a disgrace even to this most questionable square,—I am free to confess my heart sank within me. I need not describe the gloomy, repulsive aspect of the premises, which for years have looked as if they might well have been the scene of one of Dickens's stories; nor need I dwell on the air of misery and neglect which pervaded the whole neighbourhood. These points are familiar to you all. But, Gentlemen, if the exterior was repelling, what shall I say of the interior? Words fail to describe its dingy, melancholy appearance, and yet through all this, the intelligence of the gentleman to whom I am alluding could see what we now see — a building unique in its fitness for the purpose for which it is applied; and, as if to make his triumph the more complete the arrangements had not been long concluded before all London was startled with the news that

Leicester Square was to be converted from a wilderness into a little paradise.

Mr. Albert Grant, the hon. member for Kidderminster, has succeeded, after many difficulties, and at great expense, in purchasing the property, and in the most generous manner has notified to the Metropolitan Board of Works his intention of presenting it to them in trust for the public as a place of recreation. He has further announced a munificent intention of laying out the square in a costly and tasteful manner, and of adorning it with statues of eminent men formerly associated with the locality. Commissions for these statues have been given to leading sculptors; and when the generous donor's plans are carried out, London will possess an additional attraction, and a long-standing reproach and scandal will have passed away.

We owe Mr. Grant our best thanks, which I venture in your name on this occasion to express, for having so considerately yielded to a request to substitute for the statue of Dr. Johnson that of John Hunter, who actually lived in this square, and commenced here the gathering of that marvellous museum, which has no rival in the world. As dentists, we must be particularly gratified by this change, as we shall ever have, looking on this our School the effigy of him whom we have always regarded as the true father of dental surgery in this country.

But a difficulty yet remained; and that was, to find the money necessary to convert such a dirty, dismal, dungeon-like place, as this house was, into a building worthy of the Dental Hospital of London. This was not a difficulty likely to stand long in the way of one who had already overcome so many. Mr. Saunders—and it is of him, Gentlemen, you are all aware I have been speaking—nobly gave £500, and his wife £100; and in addition to these munificent gifts, he has obtained the greater part of the money which has, so far, come to us from without. I am glad to say that, though many felt as I did when I first saw the building, doubtful of its fitness for the purpose, all, with scarcely an exception, have nobly seconded Mr. Saunders's efforts; and I am proud, as the Treasurer of the Building Fund, to be able to inform you that the building, with all its fittings, will be handed over to the Hospital authorities free of debt;—no unworthy institution even in this great city, celebrated as it justly is throughout the world for its noble philanthropic and voluntary institutions. But for Mr. Saunders's disinterested and intelligent munificence, the work of this Hospital would still be carried on in that dark corner house in which it first saw what I can hardly, even by a poetic licence, term "the light of day," but the twilight of early dawn.

In furtherance of its educational scheme this

Society has founded a Museum and Library. The Museum is at present small, but it is growing as rapidly as we can expect. The Society may be congratulated on having had, for the last two or three years, the services as Curator of a gentleman eminently fitted by knowledge and zeal for the post, and under whose care it has assumed an order and arrangement which make it a credit to the Society and a value to the whole profession. Mr. Charles Tomes reports that "during the past year the contributions to the Museum have been considerably in excess of previous years—that it contains many unique specimens which cannot be matched in any other European or American collection;" and he proposes, having received the sanction of your Council, to issue with each number of the "Transactions" a drawing of the more valuable specimens, accompanied with a description of the object figured on a separate sheet, so that in time the members will have an illustrated catalogue of the Museum. The report, which is too long to be incorporated in this address, will, I hope, appear in our "Transactions," as it contains many suggestions which I think it well the members generally should know, for doubtless, many would be found ready to act on them.

With respect to the Library, the Society is to be congratulated on having secured the services, as Librarians, of two gentlemen in succession who have taken much pride in their self-imposed task,

—Mr. Fletcher and Mr. Thomas Rogers. Under their successive labours order has been brought out of chaos. The Library is now admirably arranged, and a good Catalogue has been compiled. As a technical library it needs little to make it complete.

I now come to the last object which the founders of this Society had in view,—that "of providing a point of union where subjects of interest might be fairly discussed, and contributions hitherto scattered through the pages of medical journals might be collected to form a library of reference." We must all admit that in this point, as in the others, the Society has been a success beyond almost what its founders could have been sanguine enough to expect. It has issued a series of volumes of "Transactions" which, on the whole, would do credit to any Society. Many of the Papers which have been read and published have been of great research and value; and when one considers the narrowness of the field in which we work, I think great credit is due to those who have contributed to our "Transactions," for the freshness and originality of their Papers. The volumes which have been already published by the Society are indeed a valuable library of reference. The meetings are always well attended, and, in addition to the Paper, there is a copious supply of incidental communications of great practical value.

During the short existence of this Society the attention of the whole medical world has been drawn to an anæsthetic which in many respects eclipses its predecessors in its marvellous powers. As Nitrous Oxide was first made practically available as an anæsthetic by a dentist, it was but natural that this Society should be early in the field as an investigator of its merits. It appointed a Committee, which has issued, under the sanction of the Council, two exhaustive Reports on this agent; thus illustrating the great importance of the existence of such a Society.

It is a remarkable fact, and one which cannot be passed over in silence at such a moment as the present, that the world is indebted to a dentist for the original application of a highly volatile body as an anæsthetic. The enormous popularity of Chloroform, especially in this country, has almost caused people to forget the man to whom, above all others, the merit is really due of producing insensibility to pain under the surgeon's knife. To a dentist in an obscure part of America the credit belongs of introducing the first anæsthetic —sulphuric æther—one to which, after a brilliant career enjoyed by its rival, men are returning under a belief that it is more safe. That the world should be indebted for such a boon to a dentist, who, unhappily, after conferring such a blessing on suffering humanity, died in penury, leaving a widow and a son to struggle with adversity, is

a fact which must not be forgotten. Would that the outside world had supported an effort recently made to send substantial help to her whose husband had so blessed his race!

I have not yet made any allusion to the gratifying financial progress of this Society. By dint of great economy in management, it has accumulated a small capital, which, I venture to hope, it will use from time to time in rewarding men who confer signal benefits on their profession. My mind at this moment recurs to one who has conferred within the last three or four years one of the greatest boons our profession has ever received. I refer to Dr. Barnum, who has given us the coffer-dam. I cannot detain you while I describe the immense benefit which his application of a very simple material has conferred on the public. To those amongst us who are dentists, any such description is unnecessary; but I will venture to express a hope that some early occasion will be taken to show Dr. Barnum how highly his invention is appreciated on this side the Atlantic.

Apart from the direct advantages which have accrued from the existence of this Society, I think every one will be ready to admit that a very much higher tone of professional conduct has pervaded the whole body of late years. The elevating influence of the Society has spread far beyond its own circle, and, although there are

still to be found too many practising as dentists who are utterly unworthy of any recognition, we cannot but hope that the day is drawing near when a similar protection will be extended to the public against dental as against medical impostors; and that those only will be able to practise our art who have by a recognized course of study qualified themselves to pass such an examination as will then be deemed necessary to assure the public against absolute ignorance. Until, therefore, some such protection has been extended to our craft, this Society will not have fully accomplished its purpose; but the thorough and efficient manner in which it has performed its actual work will, I trust, satisfy all that it will not fail to move when wisdom suggests that to move is to succeed. I venture on my own responsibility to say this much in answer to the demands often put forth in the pages of various journals. I know the Council is ever alive to the honour and real welfare of the profession, and its members at large may rest assured that it is often in action when, from its silence, it might be supposed to be asleep.

One of the medical reviews in a recent article says, "Perhaps there is no speciality in surgery which has made greater advances within the last ten years than that concerned with diseases of the dental organs." We who know what has taken place among us can endorse every word of

this statement. I often say our work has been revolutionized within the last twenty years. I believe I am not exaggerating when I say that we now save 80 per cent. of teeth which so re-recently as twenty years ago were sacrificed. We have added enormously to our labour, I fear, without any corresponding increase in our pecuniary reward. The public are too apt to think that one stopping is very like another; and to offer us the same fee for one to which we may have devoted an hour or even two hours, as for one on which we might have spent a few minutes. I feel that some effort should be made by the entire body to change this system, or it will inevitably bring back a less thorough style of work than that which we all are now endeavouring to accomplish. The difficulty of the operation of stopping a tooth is far greater than the outside world imagines. Some time since one of our most distinguished civil engineers was standing by my side while I was filling a tooth, and expressed his astonishment at the difficulty of the operation; he said it was engineering of the most perfect kind on a minute scale, and required in the highest degree the peculiar talent necessary for success in his own profession.

In the mechanical department of our work changes as great as in the surgical department have taken place. Here, too, we accomplish results which a few years since were scarcely

dreamed of, so that artificial teeth are now, indeed, regarded by the physician as necessary adjuncts to his art of healing.

But, Gentlemen, time would fail me to enumerate all the miseries which are inflicted by diseased teeth, and consequently all the benefits which Dental Surgery has conferred on suffering humanity. I live in hope that the time will come when the value and importance of our speciality will receive that gracious recognition which discriminating Royalty has not been slow to accord to every branch of science or art which has proved itself to be a benefit to the nation.

One aspect of Dental Surgery remains to be briefly noticed,—that which relates to jurisprudence. I believe the important evidence which might at times be given by dentists will ere long be more frequently made use of than it is at present. It must be in the recollection of all how, a few years since, guilt was brought home to the murderers of O'Connor through the evidence of his dentist. It happened to me once, by my technical knowledge, to prevent a man being put on his trial for murder. The case was briefly as follows: A woman who had been seen walking one evening in a lane with a man with whom she was keeping company, was missing the next day. Suspicion naturally fell upon her companion, against whom, however, no evidence of a

conclusive character could be brought. Several years afterwards, alterations were being carried out in this lane, when the labourers came upon a skeleton. The news soon spread through the village, and every one hoped that at last the body had been found, and that the mystery would be cleared. On hearing the rumour, a surgeon said, "If that is the body of poor Sarah, you will find the first jaw-tooth of the right side of the lower jaw missing, for I extracted that tooth just a fortnight before she disappeared." On examination, that tooth was absent and no other. On the strength of this fact the supposed murderer was again apprehended; but during the examination, some magistrate, more intelligent than his fellows, suggested that the opinion of a dentist might be valuable. The skull was accordingly brought to London by the superintendent of police, and shown to me, when I at once pronounced it not to be the skull of the young woman, for the tooth had evidently been extracted a year, at least, for the absorption of the socket was complete. Moreover, the molar teeth were much too abraded for a young person. Under these circumstances the case was not proceeded with. The works in the lane, which had been stopped, were resumed, and it was then discovered that the lane ran through what had at one period been a burial-ground.

I met, also, last year with a remarkable case,

in which two families claimed a body found in the Thames as their relative. One of the families, being Roman Catholics, had engaged a priest to say masses for the soul of their relation, ordered the funeral, and would have buried the body; but the evening before the funeral, the members of the other family thought of requesting that the mouth of the deceased might be examined. In it were found some artificial teeth, by which the dentist who made them could identify the body as belonging to the non-Catholic family. The points of resemblance between the two missing gentlemen were numerous and remarkable, including baldness, a short leg, slight malformation about one of the wrists, and other marks.

But, Gentlemen, great as has been the progress made in our art of late years, we cannot accept the advice given on a memorable occasion, to "rest and be thankful." The latter we may and ought to be, for work already done; but rest we cannot. Ceaseless labour must be ours. There are vast fields yet to be explored. It appears to me sometimes as if the progress we have made has been merely in removing error; and perhaps in substituting one error for another. Who shall say but in a few years, with improved means for investigation, changes far greater than any we have yet made will not be brought about? An acute French writer says: "All philosophy is founded on these two things—that we have a great deal of

curiosity, and very bad eyes. In astronomy, for example, if our eyes were better we should then see distinctly whether the stars really are, or are not, so many suns, illuminating worlds of their own; and if, on the other hand, we had less curiosity, we should then care very little about this knowledge, which would come pretty nearly to the same thing. But we wish to know more than we see, and there lies the difficulty. Even if we saw well the little that we do see, this would at least be some small knowledge gained. But we observe it different from what it is; and thus it happens that a true philosopher passes his life in not believing what he sees, and in labouring to guess what is altogether beyond his sight. I cannot help figuring to myself that nature is a great public spectacle which resembles that of the opera. From the place at which we sit in the theatre, we do not see the stage quite as it is. The scenes and machinery are arranged so as to produce a pleasing effect at a distance; and the weights and pulleys, on which the different movements depend, are hid from us. We therefore do not trouble our heads with guessing how this mechanical part of the performance is carried on. It is, perhaps, only some mechanician concealed amid the crowd of the pit, who racks his brains about a flight through the air, which appears to him extraordinary, and who is seriously bent on discovering by what means it has been executed.

This mechanic, gazing and wondering and tormenting himself in the pit of the opera, is in a situation very like that of the philosopher in the theatre of the world. But what augments the difficulty to the philosopher is, that, in the machinery which Nature presents the cords are completely concealed from him—so completely, indeed, that the constant puzzle has been to guess what that secret contrivance is which produces the visible motions in the frame of the universe. Let us imagine all the sages collected at an opera—the Pythagorases, Platos, Aristotles, and all those great names which now-a-days make so much noise in our ears. Let us suppose that they see the flight of Phaëton, as he is represented, carried off by the winds; that they cannot perceive the cords to which he is attached, and that they are quite ignorant of everything behind the scenes. 'It is a secret virtue,' says one of them, 'that carried off Phaëton.' 'Phaëton,' says another, 'is composed of certain members which cause him to ascend.' A third says, 'Phaëton has a certain affection for the top of the stage; he does not feel at his ease when he is not there.' 'Phaëton,' says a fourth, 'is not formed to fly, but he likes better to fly than to leave the top of the stage empty'—and a hundred other absurdities of the kind, that might have ruined the reputation of antiquity, if the reputation of antiquity for wisdom could have been ruined. At

last come Descartes and some other moderns, who say, 'Phaëton ascends because he is drawn by cords, and because a weight more heavy than he is descending as a counterpoise.' Accordingly, now we no longer believe that a body will stir unless it be drawn or impelled by some other body, or that it will ascend or descend unless by the operation of some spring or counterpoise; and thus to see Nature, such as it really is, is to see the back of the stage at the opera." *

If our forefathers had possessed better eyes, how much labour would have been spared to their descendants! Generation after generation would have continued the task of building up the great temple of eternal Truth, instead of one generation pulling down and scattering the work which a previous generation had performed, as is now too often the case. Therefore, accept nothing as final. The field in which your intellectual activity has to manifest itself is not limited by rubrics or fettered by Acts of Parliament. Its limits are the limits of Nature. Within these limits work earnestly but work reverently.

> "Search, undismayed, the dark profound,
> Where Nature works in secret; view the beds
> Of mineral treasure, and the eternal vault
> That bounds the hoary ocean; trace the forms
> Of atoms, moving with incessant change,
> Their elemental round; behold the seeds

* Fontenelle, "Pluralité des Mondes," Conversat. 1.

Of being, and the energy of life,
Kindling the mass with ever-active flame:
Then to the secrets of the working mind
Attentive turn; from dim oblivion call
Her fleet ideal band; and bid them go
Break through Time's barrier, and o'ertake the hour
That saw the heavens created: then declare
If aught were found in these external scenes
To move thy wonder now." *

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*Akenside, "Pleasures of Imagination."

Mr. Saunders.—Mr. President and Gentlemen: Those sounds, the echoes of which are now dying away in our ears, might be deemed a sufficient as they are a spontaneous and unequivocal expression of our appreciation of the admirable address to which we have just listened, and as to which we regret that there was not time to listen to it in its entirety. Your liberality, Sir, in allowing Casual Communications, has, I fear, led you to curtail that which would have been perfect if we had heard the whole. But those sounds of applause are evanescent, and it is necessary that we should put on record our appreciation of your discourse. I therefore briefly move, "That the thanks of this meeting are due and are hereby given to the President, Edwin Sercombe, Esq., for his very copious, lucid, and eloquent Address; and that he be requested to allow it to be printed separately for circulation." For although the members of this Society, and the members of the profession generally, will have an opportunity of perusing it in the journals and the "Transactions" of this Society, I am quite sure that a very large number of the medical profession and the public, in whose estimation he holds a very high place, will be only too glad to peruse it at leisure; and the circulation of such an Address, so free from all that is petty, from all that is narrow-minded, from all that is self-seeking, and taking so broad a view of the objects and interests of the profession, cannot but have a most beneficial effect. You have alluded, Sir, to the establishment of our Society now nearly twenty years ago. There are, I am sure, many here present who, like myself, assisted at its birth, and will remember as you very properly remarked, that the one thing insisted upon then was that it should be a point of union for the members of the profession, who were at that time isolated and for the most part unknown to each other. It will scarcely be believed that two men, whose names must have been familiar as household words—namely, our first president, Samuel Cartwright, and our second president, John Parkinson,—should have been within a stone's throw of each other all their lives and yet never come in contact. They were personally unknown to each other until the meeting at which the Odontological Society was formed. We are now no longer strangers to each other. We meet together at

stated periods on common ground to discuss subjects of interest to the profession, and this has been going on now for nearly twenty years; and this night, which I take to be the most interesting night since that first meeting was held, forms anew point of departure. We now stand in a more public position, and the world will see that we are an organized and united body, having at heart and pursuing with zeal the true interests of the profession and the public. We are no longer so many separate, isolated individuals. Sir, it has been said that there is wisdom in the wig, and some hold that those judicial summings-up and elaborate judgments which are a sort of intellectual feat, would lose much of their impressiveness and solemnity without the accessories of wig and gown. Well, Sir, this is the first occasion on which we have had a proper presidential Chair for the Society, and this we owe to the liberality of our excellent treasurer. And who shall say how much of the eloquence of this Address may not be due to the advantage which you have thus possessed over former presidents?

Mr. Thomas A. Rogers.—I have much pleasure in seconding Mr. Saunders' proposition, viz., that the President shall allow his Address to be printed and circulated. It refers to many questions of great importance, some of which I should have liked to comment upon, but as we have exceeded already the time we proposed to devote to this meeting, I will do no more than second the vote of thanks.

The President.—It affords me very great pleasure to accede to your request, though I feel extremely diffident about it. I do not say so in any conventional form. I have written the Address hurriedly, as a busy man necessarily must. I have jotted it down at odd moments, and if it is consecutive it is almost more than I can hope; but with an opportunity of revising it I shall be very happy to allow it to appear in the form in which Mr. Saunders so kindly proposed it should appear. I most earnestly hope that it may be the means of stimulating public attention to our art, and bringing public support to this institution; in which, as it is the offspring of our Society, we as members of the Odontological Society, have

a very deep and affectionate interest. I will not detain you longer on this occasion. I have already much to apologise to you for, as I have encroached very much upon your time, although, for the sake of brevity, I have passed over much that I should have liked to have read. I now adjourn this meeting to the second Monday in the month of April, and it is my happiness to announce that on that occasion we shall have a paper by one of our old and distinguished members, Mr. C. Spence Bate, of Plymouth, Fellow of the Royal Society, on "Transplanting and Replacing Teeth;" and short communications from Mr. James Parkinson, on specimens illustrating the operation of pivoting; from Mr. Oakley Coles on a remarkable case of deformity of the upper jaw; and from Mr. Sewell on a case of hæmorrhage five days after extraction. I have now, according to our usual custom, to present the thanks of the Society to the two gentlemen who gave Casual Communications this evening. Those communications were both of such deep interest that had this not been an extraordinary meeting we should have been glad to have spent some time in discussing them. I need not apologise to those gentlemen, however, for they are both old friends of the Society.

The President then adjourned the meeting to the second Monday in April—the 13th—the first Monday falling on the 6th (Easter Monday).

CURATOR'S REPORT.

During the past year the number of donations to the Museum has been very satisfactory, and there is every ground for congratulation in the increasing interest taken in the collection by the members and friends of the Society, which cannot fail to make our Museum, in a very few years, invaluable to every earnest student of our speciality. The Museum already contains many unique specimens, which cannot be matched in any other European or American collections ; and I am pleased to be able to add that among the recent additions are several of the utmost interest.

In order to make the more valuable specimens widely available, the Council, upon my suggestion, have resolved that a figure with descriptive letterpress be issued with each number of the "Transactions;" these being printed on separate sheets may be placed together when the volume is bound at the end of the year, and in the course of a few years will form a valuable Illustrated Catalogue.

I propose also in future to issue an Annual Supplement to the Catalogue, or a loose leaf, so that it can be pasted into member's own copies of the Catalogue.

The Museum is exceedingly deficient in *complete* regulation cases, comprising a model at the outset, the apparatus used, a model at completion of the case, and a statement of the patient's age and the duration of the treatment.

I need hardly point out how valuable such a series would be as affording data for a comparison of the result of the various mechanical contrivances used.

It would also add to the value of every donation, avoid mistakes, and very materially lighten my own labours, if contributors would make a rule of *invariably* (especially when

they themselves bring up specimens to a meeting) handing in a written statement of the points of interest, &c.

In the new Museum it is proposed to devote space to a "Regulation Series," and, it is confidently expected that it will not be long before it is filled by a number of cases which may be consulted with advantage by every practitioner.

In conclusion, I would suggest that a small case should be devoted to a series, selected from among the many duplicates now in the museum, illustrating the more ordinary points in Dental Anatomy and Physiology, which should be called the "Students' Series," and be at all times accessible to the students of the Dental Hospital. This would give to our Museum a wider sphere of usefulness, without giving unrestricted access to our more rare and valuable portion of the collection.

CHARLES S. TOMES, *Curator.*

Plate 1.

N° 106.

Wyman & Sons, Li

PATHOLOGICAL SERIES.

Plate I.

DISEASES OF THE JAW INDUCED BY THE TEETH.

No. 106.*—Dentigerous cyst in the jaw of a sheep about three years old.

Presented by J. R. Mummery, Esq.

References to Plate I.

i_1, i_2—First and second permanent incisors.

$d\,i_3$—Third deciduous incisor.

$d\,c$—Deciduous canine.

l_3—Third permanent incisor, not yet erupted; the tip of that on the left side (which is displaced) may also be seen.

p_2, p_3, p_4—Second, third, and fourth premolars, very recently erupted (the first premolar is represented by a mere rudiment, hardly calcified, in true Ruminants).

m_1, m_2, m_3—The three true molars.

In this specimen the forepart of the left side of the jaw has been expanded by a cystic growth, which is strictly confined to the one side, and does not encroach upon the symphysis.

The cyst is as large as a large walnut, and is longer than it is broad; the shell of bone covering

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* In rearranging the Museum on its removal to Leicester Square, it has seemed expedient to remove the Dentigerous Cysts from the positions which they formerly occupied in the case with Abnormalities of the Teeth, and to place them in the series illustrating the pathology of the mouth and jaws.

it is exceedingly thin, so that it is somewhat broken and imperfect in the specimen. Although the existence of the cyst was not discovered until the sheep's head had been cooked for the table, so that its contents are quite unknown, yet the cause of its formation is apparent from the specimen as it is now preserved; on the left side, of the four teeth which occupy the front of the lower jaw, viz., the three incisors and the so-called canine (which ranges by their side and is exactly like them), only two of the permanent set, namely the first and the second incisors, are in place, while two of the small temporary teeth still remain, though these latter are slightly displaced from their proper position by the growth of the cyst. One of the missing permanent teeth may be seen imbedded in the anterior wall of the cyst; while of the other there is no trace.

Judging from the dentition, the sheep had arrived at the age of three years; at this date the three premolars and the three true molars are in place, as are also the first and second permanent incisors; the third deciduous incisor is shed in the early part of the fourth year, the deciduous canine a little later. Although, therefore, the retention of the four permanent teeth is normal, there can be little doubt that the formation of the cyst was due to the developing permanent canine of the left side, of which no trace can be found in the specimen.

The jaw has been fractured just behind the cyst, but it is not known whether this occurred during the animal's life.

The specimen is one of unusual interest, because it illustrates very perfectly the pathology of the disease, just as it occurs in the human subject, in whom the absence of one or more permanent teeth after the proper period is a valuable aid to diagnosis; moreover, it is very unusual to get complete specimens from the human subject, because such can only be obtained when a surgeon, through an error of diagnosis, has performed an operation of needless severity—an event fortunately of rare occurrence.

The museum is tolerably rich in examples of dentigerous cysts, having no less than five examples from the sheep and cow, besides the contents of two cases occurring in the human subject, and wax models of M. Maisonneuve's case, in which a portion of the jaw was resected through an error in diagnosis.

PLATE II.

RESULTS OF MECHANICAL INJURIES.

No. 150.—Model of mouth of a girl about 10, in which the right upper permanent central and lateral incisors have been lengthened and rendered prominent by an india-rubber band neglected and left upon the teeth.

Presented by J. TOMES, Esq.

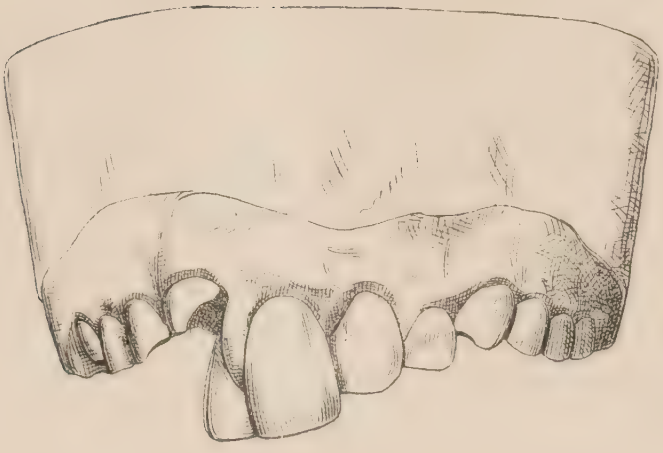
THE left upper central incisor has been brought down to the extent of about half the length of its crown, and when the mouth was shut passed outside the lower lip; the left lateral is lengthened yet more, hardly less than by the whole length of its crown, but it did not pass outside the lip.

The gum embraced the roots of the teeth closely, and they were pretty firm in their altered position.

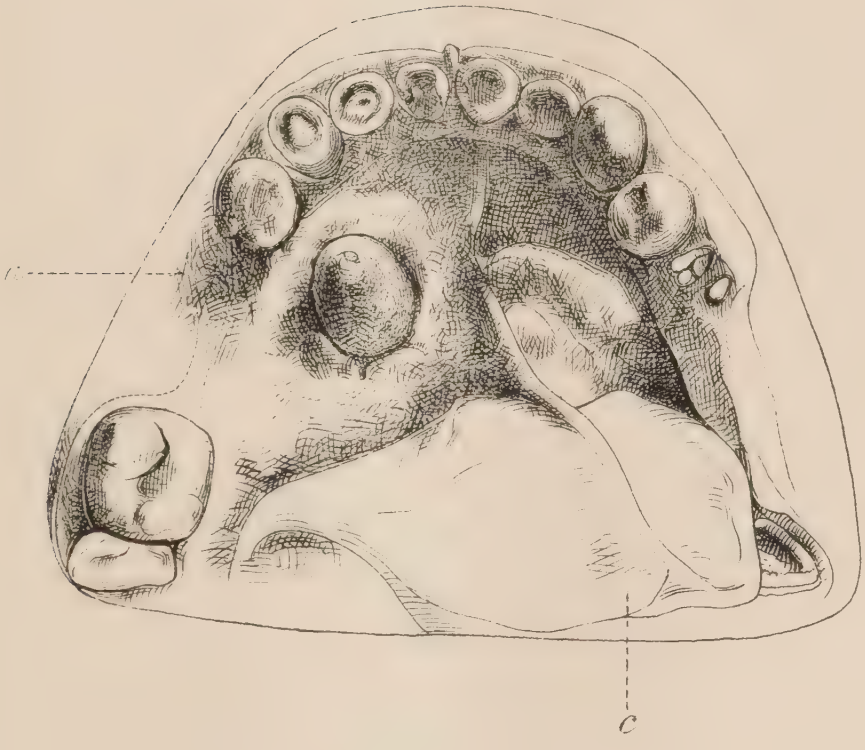
The india-rubber band which had caused the deformity was placed upon the teeth, and it having happened that it was not removed for a little time, it became hidden beneath the edge of the gum, and so was forgotten. It remained upon the teeth about a month, so far as could be learnt from the patient's mother, who brought her for an opinion as to the best course to pursue; the extraction of the teeth was advised.

Plate II.

No. 150.



No. 12.



Wyman & Sons, Lith.

friable, while round this the concentric laminæ were hard and dense. I was unable to find any foreign body which had acted as a nucleus.

The model, representing the appearance of the mass as seen lying beneath the tongue, was made by Mr. Gurnell E. Hammond, from a sketch made by him at the time, and I am indebted to him and to Mr. C. Rogers for the notes of this case.

C. S. T.

GENERAL MONTHLY MEETING.

Monday, April 13, 1874.

EDWIN SERCOMBE, Esq., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Edwin Saunders wished to state that his attention had been called to an erroneous statement made by him in his remarks upon the President's address at the last meeting. He had stated that Mr. Cartwright, the first President of the Society, and Mr. John Parkinson, the second President, were, though living within a stone's throw of each other, perfect strangers until the first meeting of the Odontological Society. He should have said until the first of certain social meetings which paved the way for the foundation of the Odontological Society.

Mr. M. W. Halliday, 4, Nottingham Street, London, was proposed as a resident Member of the Society.

Mr. J. H. Mummery, M.R.C.S., L.D.S., was elected a resident Member of the Society.

The following Donations were announced :—

From Mr. C. J. Fox, model showing supernumerary teeth, with the supernumerary teeth.

From Mr. Moore, of Windsor, case of union of upper right central and lateral incisors; also specimen of abnormal wisdom-tooth.

The PRESIDENT.—This is the time for Casual Communications. Unfortunately we are disappointed of two we were promised on the last occasion. One was from Mr. Oakley Coles, who brought models to illustrate the case at our last meeting, but there being no time to receive the communication, he left them here, and, unfortunately, the Curator has locked them up in the Museum, so that we cannot get at them. This case must, therefore, be again deferred. Then, knowing that this was to be rather a full evening, Mr. James Parkinson thought it better to postpone his promised communication with reference to pivoting teeth. However, Mr. Sewell has a communication to make to us.

Mr. SEWELL.—On Wednesday, 11th of February, a boy of fourteen years of age was brought to me for the purpose of having the first molar extracted from the lower jaw on the left side. He took nitrous-oxide gas, and the tooth was taken out. He was a small, delicate-boned boy. There was some amount of periostitis. The molar was one of those enormous teeth which come out of soft, ill-formed jaws with a remarkably small amount of force. He washed his mouth with warm water; the bleeding ceased, and he went home. I heard no more of the case till the following Monday, when I received a note from Mr. Walker, surgeon, of Maida Hill, telling me that he had been called up to see the case that morning, the child having suffered from profuse hæmorrhage, and asking me to see it with him that afternoon. I went up, saw the case, and learned the history. It appeared that, after leaving me, some slight hæmorrhage occurred, which had been stopped by iced water, and no bleeding followed until early on the Monday morning. At five o'clock that morning the boy awoke the attendants in the adjoining room, finding himself bleeding and that he had lost a good deal of blood. Mr. Walker was sent for; and when he came he found a good stream of blood flowing from the alveolus. He succeeded in stopping the hæmorrhage in about an hour by plugging the alveolus with great force with lint. The hæmorrhage was profuse—a full stream,—and had the appearance of being arterial rather than venous. The child showed symptoms of loss of blood, and when raised to a sitting posture

he had an attack of syncope. He continued in that weak condition for several days. Mr. Walker, who is a surgeon of great experience, estimated the amount of blood lost at not less than sixteen ounces. We constantly have cases presenting themselves in which patients say they lost a great deal of blood, when there has been, in fact, only trivial oozing. It is difficult to estimate the exact quantity of blood lost in any case. An ounce or two of blood mixed with water makes a great show. In this case, however, there was beyond doubt very severe hæmorrhage, and it might have endangered life if it had not been arrested by art. I think myself that probably the bleeding was arterial—that it was not a case of hæmorrhagic diathesis. I have seen, in my own experience, two cases of arterial hæmorrhage occurring *immediately* after the extraction of teeth; one of them within the last fortnight, to which I shall probably have occasion to allude at a future meeting.

Mr. Charters White.—I do not know the opinion entertained by the profession generally in reference to the use of the styptic colloid of Dr. Richardson in those cases of hæmorrhage. I find it very useful indeed, accompanied by plugging. I remember one case when I had charge of the Pimlico Dispensary. A florid, stout woman came to me about 9 o'clock in the morning, and I extracted her tooth. There was no difficulty about it, and apparently no hæmorrhage. She went away very well. During the night hæmorrhage came on, when she got warm, and everything about her bed was saturated with blood. I was sent for about half-past 8 in the morning, but I could not go just then. and about 2 o'clock I ran round to her lodgings to see her. I found a marked contrast in the woman. The florid face had become quite blanched, and every receptacle about the room was filled with blood. I took with me the styptic colloid and some cotton wool, and plugged it up thoroughly, but that had no effect. I then took the ether spray apparatus, and injected a spray of colloid right down into the alveolar socket as far as it would go, which checked the bleeding slightly. In addition to that, I plugged it with cotton wool saturated with the colloid, and made a wedge for her to bite on, and so kept it in its place. In that way I found I checked the bleeding. I

now never let a patient go away until I see a thorough clot formed, and that no oozing of blood takes place. If I see oozing, I always put in a plug of cotton wool with the styptic colloid. I do not know whether it is generally used. I have also found iced water very effectual in answering this purpose; but I much prefer Dr. Richardson's styptic colloid.

The PRESIDENT.—The case brought forward by Mr. Sewell is one of much interest, from the fact that so long an interval elapsed between the operation and the time of secondary hæmorrhage occurring. We must all have met with cases of secondary hæmorrhage in our practice; but in my experience I have never met with a similar case. With respect to the treatment of secondary hæmorrhage, I have never met with failure from the use of muriated tincture of iron, I have therefore never tried the colloid. The important point in dealing with these cases is, I believe, to get the socket thoroughly syringed out, so that the badly-formed clot is removed, and then plug it carefully from the bottom. A mistake we very often make, I believe, is putting in too large a plug at first, which gets only halfway down the socket; when probably the bleeding is further down than that, and so the hæmorrhage is not stopped. We should begin with the small plug, and increase it gradually. I think it possible that a great majority of the reported cases of obstinate hæmorrhage might have proved more tractable if more care had been taken on this point.

Mr. RANGER.—I have here, Sir, an interesting specimen. It is the skull of a New Zealander, taken from a cave near Auckland. It presents some very remarkable peculiarities, especially in the lower jaw; the four anterior lower molars are entirely inverted, lying horizontally upon the alveolar plates. They are worn completely down, and the pulp-cavities are exposed. The skull was exhibited by Professor Busk some time ago at the Anthropological Institute, and he then likened it to that of an old cab-horse, and suggested that the man had worn a bit, having possibly been a prisoner taken in war, and perhaps had this imposed upon him as a punishment. If that were the case, he must have suffered an enormous amount of

pain and inconvenience. If you look at it carefully, I do not think you can arrive at any other conclusion than that the man has worn a bit. One upper molar is standing, but it is much worn away, and there is just a space between that and the lower tooth which would admit the posterior portion of a flat bit made of the hard wood the New Zealanders use for constructing their spears. But I should suppose, considering the length of time it must have been worn, that instead of using it for a punishment, it had possibly been used for a religious ceremony; the man perhaps having been an enthusiast in his religion, and having worn it as a special mark of favour to his gods. Possibly there may be some member present who could throw a little more light on the matter : I believe the case is entirely unique. As far as it goes, it is very interesting and unusual to meet with among savage tribes, whose teeth, as a rule, are so remarkably regular and free from decay in any way. I may just add that the Anthropological Institute will be very pleased if this Society could give an opinion upon this remarkable specimen.

The PRESIDENT. — It is a very remarkable specimen. It appears to me that the individual must have worn something in the shape of a bit, from the fact that there had been no teeth in the upper jaw for a very lengthened period, judging from the condition of the alveolus, either to push the lower molars into the horizontal position they are in, or to abrade them to the remarkable extent to which we find them.

MR. RANGER.—Perhaps the teeth of the upper jaw were knocked out afterwards.

The PRESIDENT.—No ; they must have been lost a very long time, from the absorption of the alveolar socket, and there has been a great amount of alveolar irritation where these teeth have been pushed out of their sockets, not only abrasion along the teeth as they now lie in their horizontal position, which can only be accounted for by the fact that they must have been rubbing against some very hard body, and that hard body has not been antagonizing the teeth because there were none there

to antagonize. Are you aware of any religious ceremony by which the Maoris would subject themselves to wearing a hard body like that?

Mr. Ranger.—Unfortunately there is no history of anything of the sort. I have made many inquiries among several of my friends who have been in New Zealand. One man especially, who was there ten years, and could speak the language almost as fluently as English, tells me there is no tradition whatever, either of a punishment of the sort or of any religious ceremony. This evidently is a prehistoric skull, and tradition may not go back quite so far as that.

Mr. Norton.—I think it could not have been done suddenly. It must have been a very gradual movement, I should think, to bring the teeth into that position, because the fangs are curved, and no sudden action would curve a fang to that extent.

The President.—If, as Mr. Ranger states, it would be agreeable to the Ethnological Society, that the opinion of this Society should be given on the case, I think it would be well that a committee of the Society should be appointed to examine and report on it. It is so interesting that it is well worthy of a careful opinion.

Epithelioma of the Tongue. By T. Charters White, M.R.C.S., L.D.S.

The nature and origin of cancer are problems of pathological science, around which much obscurity rests, and is likely to rest, till future investigations have thrown more light on them, therefore I would not attempt to explain what older and abler men still treat as enveloped in vagueness and uncertainty; but as it sometimes happens that as Dental Surgeons we are consulted in reference to some painful affection of the tongue, and are asked with much anxiety if it is cancer, I hope I may be allowed a few moments for a Casual Communication, having for its object the introduction of a specimen of Epithelial Cancer of the Tongue, which I have placed under my microscope this evening for the inspection of the members,

and for a few remarks upon it that may prove of advantage, by provoking discussion on this interesting and important subject.

When we consider that, according to Sir James Paget, Epithelioma of the Tongue is only exceeded in its frequency of occurrence by cancer of the breast, and also bear in mind the brief space of time it usually takes to run its course, and reach a fatal termination, we can readily appreciate the dread its suspected advent creates in the minds of both patient and practitioner. The *origin* of that which we vaguely call "Cancer," is, as I have before remarked, wrapped in much obscurity, and must be left to futurity to unravel; but there is no doubt in my mind about the causes which produce that manifestation of this disease which most concerns us as dentists. In the first place, there may be, and often is, an hereditary tendency predisposing to the production of cancerous growths, combined with a derangement of the general health; there may be an irritable state of the mucous membrane of the tongue, only wanting a ragged tooth or the edges of a badly-fitting piece of artificial work to light up the disease we are considering this evening with all its disastrous results. The first morbid action becomes the seed for the extension of the malady, and favoured by the loosely-compacted tissues of the tongue, its connective fibre-spaces and its lymphatics, the whole organ speedily becomes infiltrated with the germs of this morbific agent. Wherever these germs rest in the surrounding tissues, they become fresh centres of diseased action, drawing upon the general nutrition of the system for the materials by which their propagation and growth are extended at the expense of the patient's strength and life. But as there are many affections of the tongue which are not malignant, we should be in a position to discriminate between those that are so and those that are comparatively simple affections amenable to ordinary medical treatment.

Those amongst the members present who have read Mr. Fairlie Clarke's valuable monograph on the Diseases of the Tongue, will remember how fully he describes the different appearances whereby a correct diagnosis may be arrived at in deciding the question of the malignancy or non-malignancy of

the diseases that may effect that organ. It is not every ulcer of the tongue with indurated borders that is an Epithelioma, or likely to become one—such an one may be due to a syphilitic taint, or to derangements of the digestive tract, and readily controlled by proper medical treatment, and local applications, such as carbolic acid lotion; but should it occur at either side of the tongue in a person of middle age, and accompanied by a peculiar cachectic state of the health strongly indicating a cancerous diathesis, it should awaken in us grave suspicions, and lead to a closer and more careful examination into the history of the case.

Mr. Clarke, at page 104 of his work that I have before referred to, mentions an appearance that may awaken alarm in our minds upon the first glance at it, but which he states may be due to simple hyperplasia. But an instance came under my notice a few years since, which illustrates the caution we should use lest we dismiss circumscribed indurations in the substance of the tongue as merely of hyperplastic origin. A woman called on me complaining of a hard lump at the middle portion of the left side of the tongue; she stated that it was so painful, and the pain was of a "stabbing" character, that she could only eat with great difficulty, and at other times remain free from pain when her tongue was kept above the level of her lower teeth.

Upon examining her mouth I found the teeth on that side perfect and free from ragged edges. The tongue was swollen, and every tooth had left its impression on the mucous membrane. About the middle third of the upper part of the left side I detected the hard lump complained of as a tumour, about the size of a small bean, with distinctly circumscribed borders, and in addition to this two other and smaller ones extending backwards in a line towards the root of the tongue. The surface of the principal tumour was covered with papillæ of a slightly larger character than those covering the rest of the mucosa, and the body of the tumour appeared red and swollen. I referred her to seek immediate surgical aid, but whether she applied at once, or delayed till too late, I do not know; but when last I heard of her she had died after a wretched lingering illness of epithelioma of the tongue.

Now had this case been operated on in the stage at which it first came under my notice, doubtless the woman's life would have been prolonged, but being neglected, time would be given for a dissemination of the cancerous elements into the neighbouring tissues, and surgical aid would be powerless to stay the progress of the epithelioma.

Mr. Fairlie Clarke, in opening that chapter of his book dedicated to the consideration of "Cancer of the Tongue," says that it is chiefly met with under two forms, sometimes showing itself as soft, warty excrescences, at other times as a dense structure. It may commence as a small elevated growth or hard lump in the substance of the tongue or as a blister or crack.

Viewing the case I have just described as an illustration of the former of these modes of developement, I think we may regard that from which the specimen I have brought to-night was taken, as a type of the second form of origin. I am indebted to the kindness and courtesy of Mr. John Wood, of King's College Hospital who operated on the case, and to Mr. H. B. Willans who had the charge of it, for the following details, which will fully enforce the desirability and advantage of surgical treatment in these cases, even when the disease had advanced to the serious extent to which it had in this.

H. P. aged 37, married, was admitted into Wigram Ward, King's College Hospital, under Mr. John Wood, on the 7th of January, 1874.

Shortly after her confinement, last July, she noticed a white-looking scratch on the right side of the tongue; in a month or so this became a little cavity into which she could introduce the top of her little finger. She entered the London Hospital, where she remained six weeks; the tongue became worse, but she refused to undergo an operation, and was discharged. Since then, and up to the time of entry, she had had private advice; deriving no benefit she applied and was admitted to King's College Hospital.

There is an irregular fungoid-looking mass of ulceration on right side of tongue, which, with the exception of the inconvenience, causes her no pain at the present time, though the pain a few days ago was agonizing. While the pain lasted

the glands of the upper part of the neck were enlarged and exceedingly tender, more especially at a point behind the angle of the right side of lower jaw. These swellings and the accompanying pain have since disappeared. Appetite is good, but the mass interferes much with deglutition.

Jan. 10*th.*—The patient having been put under the influence of chloroform, and Mr. Wood's gag having been arranged, a double ligature was inserted into the tongue to hold it out. By means of a sharp-pointed curved bistoury the whole mass was then extirpated.

The largest of the bleeding arteries were then tied, Mr. W. Rose's new forceps being used for the first time on this occasion. The bleeding surface was then sponged out with zinci chloride and the tinct. ferri perchlor. and the patient was directed to drink iced water.

Jan. 11*th.*—Parts very œdematous; no bleeding.

16*th.*—There has been no hæmorrhage; parts not so œdematous.

℞. Croton, chloral hydrate, grs. iij.
Mist. Camph. ʒi.

27*th.*—Chloride of zinc has been applied on two or three different occasions. There is no pain; deglutition easier, and altogether patient feels much relieved.

Feb. 6*th.*—Patient discharged.

In this case no history of hereditary tendency to cancer could be obtained, but the patient had a great many bad and ragged teeth in her mouth; and being of an ill-nourished, cachectic constitution, cancer of the tongue found a readily prepared nidus.

The specimen I have placed under the microscope is a section taken from the epithelioma removed from this patient, and will show the remarkable manner in which cancer obliterates the normal tissues of a part it attacks, and assimilates them to its own particular character. In this specimen scarcely an element of the normal tongue can be recognized, while the new tissue is occupied most extensively by the nest-cells or nodules

of epithelioma, the only part apparently free from this invasion being the sub-lingual gland, part of which has been removed in this operation. Upon an examination of this section, commencing at the outer border, we notice an enormous development of the epithelial layer, the fusiform character of the cells forming a strong contrast to the more granular character of the subjacent tissue. The epithelium seems to dip down into this by long rootlets or processes, as if it had filled in fissures caused by a cracking up of the muscular part of the organ. The granular subjacent tissue abounds in the characteristic "pearls" of cancer; these appear to have been hollows in the degenerated muscular tissue, and lined with epithelium, which, increasing in growth, at last completely fills the hollow. Upon viewing the section under the microscope, these successive layers are cut through, and their concentric arrangement bears a certain resemblance to the section of a pearl, from whence they derive their name. In some of the sections of this epithelioma I have been enabled to trace, by double staining the tissue, channels of communication from one pearl to another, suggesting the possible extension of the disease by the cell division of the pearl, by which an offshoot from the original nodule had traversed the channel to a lower depth, where it had rested, and was becoming a fresh centre for the spread of the disease. If such be the mode by which the local manifestation of this disease is propagated, it is only reasonable to assume that the earlier operative measures are resorted to, the greater the chance of *arresting* its progress; but there are germs of cancer finer than can be made evident by the microscope, and often when the surgeon has removed the more palpable effect of this disease, and the wound has healed, he can only say that he has *arrested* the malady, not cured it, and he will ever be on the watch for its recurrence: but in our practice as dental surgeons we may often detect cancer of the tongue at such an early stage that proper surgical treatment may more effectually prevent its spreading and development in the system, and so postpone to an indefinite period that recurrence so much dreaded. I feel that in these few remarks I have not been able to lay before you any point of practical advantage, or to add an atom to your knowledge of the

pathology of Cancer of the Tongue, but I trust that, if a profitable and instructive discussion can be provoked, my poor contribution may be tenderly received.

Mr. Fairlie Clarke.—Sir : As you have been kind enough to ask visitors to take part in the discussion this evening, and as Mr. Charters White has done me the honour to allude to what I have written upon the subject of cancer of the tongue, perhaps I may be pardoned for rising to speak thus early. I have had the advantage of seeing the sections which Mr. White has brought here to-night at his own house, and beautiful sections they are. The process of double staining illustrates some very interesting points, and makes them particularly suggestive. The cases which Mr. White has brought forward exemplify the two forms in which we generally meet with cancer of the tongue. The superficial form is, I think, easier to explain than the deep. There are so many slight accidents to which the tongue is liable, that, if a person gets on in life, and if such a person has a proclivity to cancer, the superficial tissues, the epithelial layers, become active, the rete mucosum dips down among the papillæ, until it produces that disturbance of the healthy arrangements of the tissues which marks the first step in cancer. I do not think it is very difficult to understand the steps by which this comes about. But it is much more difficult, to my mind to understand the other class that Mr. White has alluded to, where the cancer begins as a knot in the substance of the tongue. It is possible that it takes its origin in a mucous gland which has perhaps become obstructed or irritated ; but other cases seem to begin so deeply in the muscular structure of the organ, that it is difficult to apply this explanation, because the mucous glands run in an oblique direction, and do not dip down into the muscular substance. I confess, therefore, it has always been a problem with me to explain how these cases begin, where the first manifestation is a knot deeply placed in the centre of the tongue. There are many causes connected with the state of the teeth, which must often come under the notice of members of this Society, which are prone to excite cancer in those who have a proclivity to it. I think Mr. White lays more stress than I should upon the cancerous cachexia, for

it certainly is my experience that cancer of the tongue occurs in persons who, when the disease comes on, and during its early stages, show no such constitutional aspect as we are accustomed to call the cancerous cachexia. We are more and more disposed, in looking at the whole field of disease, to set aside the term "cancerous cachexia," and to believe that a cachexia presenting many of those symptoms which have usually been associated with the cancerous cachexia may be seen in patients who are suffering from any disease that is accompanied by great and prolonged suffering. I think, therefore, that in diagnosing an ulcer or tumour in the substance of the tongue, I should attach very little weight to the aspect of the patient. Then with regard to the growth of these cancers, it is extraordinarily rapid, and for this rapidity several reasons may be assigned. It is a very curious and striking fact to observe how a patient may have an epithelial cancer just outside the mouth, not more that an inch removed from his tongue, and yet it progresses very slowly—a cancer, let us say, on the lip or on the cheek. It is removed, and perhaps does not return for years ; the second growth is very slow, and its progress altogether extends over many years. But let the seat of the cancer just be one inch from that spot, upon the tip of the tongue, and the rapidity of the progress is something extraordinary. I have endeavoured to show by statistics that the ordinary life of a person affected with cancer of the tongue, unoperated on, is only fourteen months, and for this we may assign some special reasons. The growth is situated in an organ which is very active, which is very highly supplied with blood and with nerves ; not only so, but it is situated in a cavity where it is kept in a constant state of moisture and warmth. These conditions, which are favourable to vegetable life, just like the forcing of vegetables in a hot-house, make the nutritive processes go on at such a rate that the tumour springs up apace. Sometimes we see it cropping up in a bunch of enlarged papillæ. For these reasons the mere locality has a good deal to do with this rapidity of growth. There are other circumstances which come in and tend to destroy the life of the patient. He cannot do without his mouth. He needs constantly to swallow ; and as the disease extends backwards the

difficulty of swallowing becomes great, and presently the difficulty of breathing becomes great also; and so from its local situation the cancer tends to destroy life much more rapidly than the same disease situated in an outlying part would do. With regard to treatment, I think there can be no doubt that the only thing we can recommend at present is an early operation. Sir James Paget looks forward to the day when we may have a specific for cancer, at least he advises us to leave no stone unturned in the hope of finding one. Soon may that day arrive! But at present one hardly knows in what direction to turn one's mind even to think of a specific for cancer. With regard to this special group of cancers, I have no hesitation in recommending an early operation, because the statistical tables which I have drawn up lead me to the conclusion, that whereas the cases of cancer of the tongue, unoperated on, terminated in about fourteen months, those in which operations were undertaken—and that included a good variety of operations—extended to about thirty months. This difference is so marked, that I feel now the greatest confidence in recommending an early operation.

Mr. Norton.—I do not rise to enter into the discussion of the origin of cancer at the present time. That question has been discussed, and will be further discussed, very fully, no doubt, at the Pathological Society. Whether we may ever arrive at any true definition of cancer I cannot say, but it is evident that at present we are not much advanced in our knowledge of what cancer is or how it should be treated beyond its removal. I wish now simply to give my experience as to the difficulty in recognizing these cancers which attack the tongue. We have numerous cases brought to the hospital, and we also meet with them in private practice, in which there are jagged teeth, or projections from the teeth, irritating the tongue and inflaming it, or producing hyperplasia, and it is almost impossible to distinguish these from epithelioma. Perhaps one of the most important diagnostic signs, is the character of the pain, as the latter has invariably a lancinating pain, whilst that produced simply as hyperplasia is scarcely ever accom-

panied by pain at all. There is the other form in which we have gummatous deposits within the tongue. These again are all liable to be mistaken for cancer. It shows that there is great difficulty in recognizing certain cases from cancer, and it is only by allowing them to remain for a time under careful observation, that we can arrive at a decided opinion. But to arrive at an early and sound conclusion is most important, for we know that in the case of epithelioma, removal, when attempted soon after the disease has manifested itself, is attended usually with considerable success; in the case of scirrhus disease such satisfactory results cannot be hoped for.

The PRESIDENT.—The treatment of epithelioma does not devolve on us as dentists, or indeed are we obliged to be familiar with its physical signs, but it is, nevertheless, very desirable we should be able to recognize the disease when present, as in that way we might often be of great service to our patients, by advising them to seek surgical help when such help can be most effectually afforded, viz., in the earlier stages of the disease, before, indeed, the sufferer is in the least aware of its presence. We often see how our patients would be benefited by their medical attendant being more fully acquainted with the diseases peculiar to the teeth. Too often, alas, young people visit us for the first time to have teeth removed which an early warning from their medical attendant might have saved; in like manner, the surgeon must often feel regret that the dentist to whom his patient has been going perhaps for years has not recognized disease and given a friendly and timely hint of its presence.

On Transplanting and Replacing Teeth. By C. Spence Bate, F.R.S.

Some months back a lad of fifteen years of age came to the dispensary of this town (Plymouth), afflicted with what is not an unfrequent cause of suffering.

The lad had some years since been struck in the face with a stone, thrown by one of his comrades, and had both the upper central incisors broken. For some time they gave him no serious inconvenience. Recently, however, one of them began to trouble him. Inflammatory action was induced at the extremity of the fang, which latterly had resulted in an abscess.

The position of the teeth formed a regular arch; but the left lateral was crowded out and occupied a place behind the dental arch, on the palate. It was the left incisor that was the present source of trouble, and there was nothing to be done but to remove it. This I did; but as the lateral was a useless tooth and considerably out of the line, I determined to remove that also. It occurred to me that its transposition from its own socket to that of the alveolus of the central incisor was an object to be desired.

I have occasionally replaced a tooth that has been

but slightly decayed, after it has been extracted, into its own alveolus ; but to transfer a tooth from its own socket into another, as far as my experience tells me, has not been attempted.

In this case the lateral, being smaller in the size of its fang, could not fill the entire alveolus, and considerable doubt on my mind existed to whether or not the tooth would become firm. And moreover, from its being placed into an alveolus in which considerable inflammation had previously existed, there was some reason to fear that still further irritation might be excited, more serious, perhaps, than that for which I had to remove the tooth. This doubt was so much increased in my mind after I had extracted the tooth, that I seriously entertained the idea of abandoning the attempt.

The lateral, upon being extracted, was found to have an unusually long fang, which had moreover, from its irregular position, become distorted in its growth. So much was this the case, that it was only by considerable pressure that I was enabled to place it in the alveolus of the central incisor sufficiently high up to bring the tooth within a moderately even line; so as to prevent it from appearing to be ridiculously long.

This however I did, and requested the lad to call upon me the day after, when I was glad to find there was no irritation of an unusual extent, and that the tooth was only bearably tender to

the touch. A week after and this tenderness subsided; and in one month's time, when I saw the patient again, the tooth had become so strong and firm that it would scarcely be credited that it had not always grown in its present position.

Fortunately the lateral was an unusually large tooth, so that the intermediate spaces between it and the right incisor on the one side and the canine upon the other were not observably great.

I have models of the mouth, taken, one before the operation and a second after the restoration.

Some years since I was visited by an engineer who had received a blow in the mouth through an accident with a steam-engine, by which three or four of his front teeth were knocked out of his mouth; he picked them up and pushed them as well as he could into their several sockets, and came to me. His teeth were then hanging loose in every position but the right.

I write from memory, but think that I am correct in saying that I did not take them out of the mouth, but forced each into its normal position. These I retained in their several places by the aid of a plate, until all the teeth became fixed, which they did so strongly that Mr. Scott, of Swansea, who extracted some years afterwards one of the the teeth (a lateral incisor) that had been broken at the time of the accident and had since decayed, informed me that it was as strong

in its attachment to the jaw as is usually the case with firm teeth.

These two instances occurred in the history of persons whose ages were young, and as the replacement of a tooth in its own alveolus must require some very considerable healthy energy, I am inclined to believe that we should scarcely obtain the same results in the history of persons of more mature years.

I think that this may be evidenced by the two following cases of ladies who in each case were past their thirtieth year.

The two cases are very similar. They were in each—the one on the right side of the mouth, the other on the left—a prominent lateral, in one case loose, in the other decayed. Behind each was a strong and healthy irregularly placed canine tooth. In each case under chloroform I removed the lateral, and with a forceps, forced the canine forwards into the line of regularity with the dental arch. It is several years since these operations were performed, and I have seen the teeth frequently. For some time they looked very satisfactory; but I doubt if in either case they ever became exceedingly firm, and in one of them the tooth discoloured.

In each case, however, it has precluded the persons from having to take to artificial substitutes, and was well worth the slight amount of pain consequent upon the operation.

Discussion.

Mr. Coleman.—I presume that in his remarks respecting transplantation of teeth, Mr. Spence Bate alludes only to the mouth of the same individual; for, of course, he must be well aware that the practice of transplantation, as it has been called, was largely carried out under the hands of the celebrated John Hunter. However, I am glad he has called our attention to this subject, because it has often occurred to me that we throw away a large number of living teeth in the present day. I believe we are all agreed that it is most common now to meet with cases where, owing to defective development, the jaws are too small to accommodate the teeth in anything like an even or symmetrical position, and that to remedy this evil we must often sacrifice one or more sound and living teeth. The question to my mind has been, could not these sound living teeth be turned to a useful account?—might they not in many cases be transferred to the mouths of others? To the process as carried out by John Hunter a strong moral objection existed, namely, that sound and healthy teeth should be removed from the poor under the inducement of a comparatively small pecuniary remuneration. The other objection, namely, that disease might be thus transferred, was certainly an inferior one. The same might be held with regard to skin-grafting, to the transfusion of blood, to vaccination, and the more common process of wet-nursing. We know it is probable in all these cases that diseases such as syphilis may be transferred from one individual to another; but with proper care that risk is so small that we should never hesitate to object to any of them on such grounds. I have on a small scale attempted at St. Bartholomew's Hospital to carry out this practice, but unfortunately with at present no success; but I believe, with such scope as we have at the Dental Hospital, this really might be carried out upon a much larger scale, and that we might within one or two years have statistics before us to enable us to determine whether this

process might not be satisfactorily and usefully adopted. I hardly ever attend the latter hospital, without having to remove one or perhaps two sound teeth for the purpose of affording room in the overcrowded jaws of young patients; and I still more frequently have to remove a greater number of useless teeth from persons wholly unable to afford the cost of artificial ones, and who might well in many cases prove fit subjects for the operation of transplantation. I trust this paper may, by calling our attention to the question of transplantation, at all events, result in our giving it at this Hospital a fair trial under the conditions I have mentioned.

Mr. Vasey.—This is no doubt one of the most interesting subjects that can be brought before us. John Hunter, who is an authority on the transplantation of teeth, candidly says in his works that out of many attempts he made to transplant human teeth into the cockscomb he only succeeded in one case. That one case is in the College of Surgeons, and I understood from the curators that it is a specimen rarely looked at. Professor Owen, in his "Odontography," accounted for the success of that one case to the presence of the cementum surrounding the root. Large experience of cases of dislocation and partial dislocation, all bringing about necrosis of the teeth, made me account for it differently, especially when I observed that even the partially successful cases were not cases of adults but of the young. If the union of dislocated teeth depended, as Professor Owen thought, on the cementum, they ought to be more successful in the adult, because the cementum is much greater. I came to the conclusion that the tooth Hunter succeeded with must be a young tooth, having little or no cementum. When I had opportunity of examining the specimen in the College of Surgeons, I found it a canine tooth, the root only partially formed, the extremity of it as open as a quill, and the union to have taken place through the large unossified pulp. I believe, from large experience, that fractures and partial dislocations become necrosed, and are retained under the best circumstances only for a few years. Transplantation is an operation that must give rise to most pernicious results. From the last Report of the Dental Hospital, 12,000 teeth have been extracted during

the year, giving ample opportunity for experiment. Three or four years ago Mr. Coleman kindly read us a paper describing a number of cases in which he extracted diseased teeth, scraped the periosteum from the roots and replaced. I think that some eight or nine out of thirteen or fourteen cases were at the time successful. I had hoped by this time we might have heard whether any of the cases were permanently successful. I should certainly advise the members of the Society carefully to examine Hunter's successful case, and not to be led away with the idea that in any case, and at any age, transplantation will succeed. Mr. Spence Bate refers to the age, although he does not explain his reasons for believing that such operations will be less successful with the adult than with young persons. His attention has been drawn to it, however, in treating the cases referred to.*

Mr. C. White.—That teeth that have been extracted can be united again to the socket, is an undoubted fact. I think I have mentioned once before an accident that befel me ten or twelve years ago, when, in extracting a first molar tooth for the sister of one of our rising surgeons, a girl of about sixteen, the second bicuspid came out with it. There was no accident, such as getting the forceps between the two teeth, but the tooth had a large cavity in its anterior aspect, and into that cavity the head of the second bicuspid leaned. The molar tooth came out perfectly entire, and attached by a soft pulpy mass at the root was the second bicuspid. I immediately wiped the second bicuspid quite clean, put it back into its socket, and tied it in with a silk ligature. That tooth now is as sound and serviceable and of as good a colour as the rest. The difficulty that appears to me to arise in this matter of the transplantation of teeth is this :—if you take sections of roots of bicuspid teeth you may take out, you will find they vary very greatly, and it is a great chance whether the teeth you extract from one person will fit sufficiently accurately into the socket of another

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* In the *Lancet* of 8th June, 1861, will be found a short paper by Mr. Vasey on the subject, with illustrations.—[Ed. *Trans.*]

to unite. There appears to be the difficulty. It has been suggested that the fang should be filed away, and made to fit the socket of the person into whose head you wish to transplant it; but if that is done, I do not think any union will take place, it will simply become a foreign body, and a source of great irritation and annoyance.

Mr. Coleman.—If I recollect rightly, Hunter, in his remarks, quoted by Mr. Vasey, is referring to his experiments of the transplanting living teeth into the very vascular substance of the comb of a cock. I very well remember Mr. Vasey's paper on the subject in the *Lancet*, and considered it an excellent explanation of the solitary case in which a vascular union was proved by injection to have taken place. A very interesting case occurred in the dental department at St. Bartholomew's Hospital. My friend Mr. Lyons removed a living tooth from a female adult patient, filled it and returned it to its alveolus; the tooth became quite firm, but after some months the filling came out, when, upon examining it, we found, to our surprise, the dentine most acutely sensitive.

The President.—That the replantation of teeth is an old operation we have the best possible evidence in our Museum. We have there a perfectly unique water-colour drawing, made in the year 1787, of three or four groups of people in the same room undergoing the various stages of the operation of replantation. The fact that attempts have been made over a very long period to take a tooth out of the socket in one mouth and place it in the socket in another mouth, is established by that drawing beyond all doubt. But I have always felt the same difficulty Mr. Charters White appears to have felt to know how a tooth removed from one socket can be inserted into another. I have never found the teeth of one skull to fit the sockets in another, and they cannot be made to do so better in the living subject than in the dead. That a smaller tooth may be placed in the socket of a larger tooth, as in the case mentioned by Mr. Spence Bate, is of course quite possible, but by what means this should ever become quite firm I cannot see. But what I cannot understand is the successful transplant-

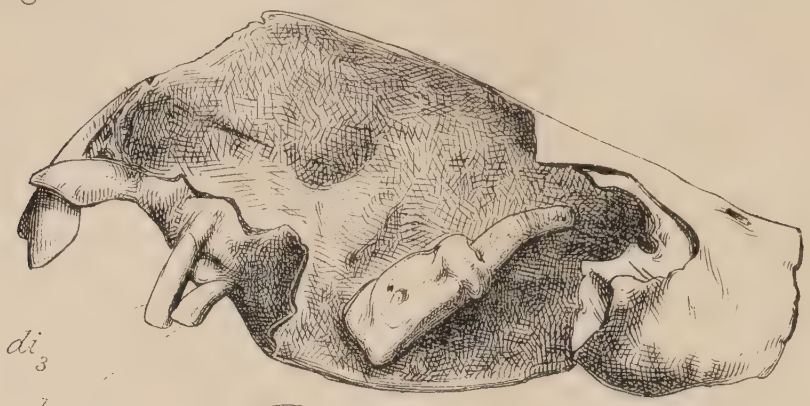
ing of a tooth from the alveolus of one person to that of another. I think the suggestion made by Mr. Coleman is a perfectly justifiable one. Hospitals are established not only for the purpose of giving relief to the poor but of carrying out legitimate experiment, and if that experiment can be tried in this Hospital, I think it will be accomplishing one of the objects at least for which it was established, and the public at large will be great gainers if we can utilize those good teeth which we are unhappily obliged so often to sacrifice. My opinion is certainly adverse as to the success of the experiment, but it is one which can only be established or condemned by a large series of cases carefully observed, and for which the Hospital would afford peculiar facilities. I have now to return your thanks to Mr. Spence Bate for his valuable paper; to Mr. Sewell and Mr. Charters White for their very interesting casual communications; to Mr. Ranger for that interesting specimen which he has brought under our notice; to Mr. Moore for the specimens which he has presented to the Museum; and to Mr. Fox, also, for a model with the original teeth of a case of supernumerary teeth.

At our next meeting Mr. Thomas Bryant, of Guy's Hospital, will read a paper "On Dentigerous Tumours of the Jaws," illustrated by specimens; we shall also have the pleasure of hearing casual communications from Mr. Fletcher on a new expanding amalgam, from Mr. Oakley Coles on a case of deformity of the upper jaw with malformation of the teeth, and from Mr. James Parkinson, on specimens of pivoted teeth.

Plate 3.

DENTIGEROUS CYSTS.

Fig. 2.



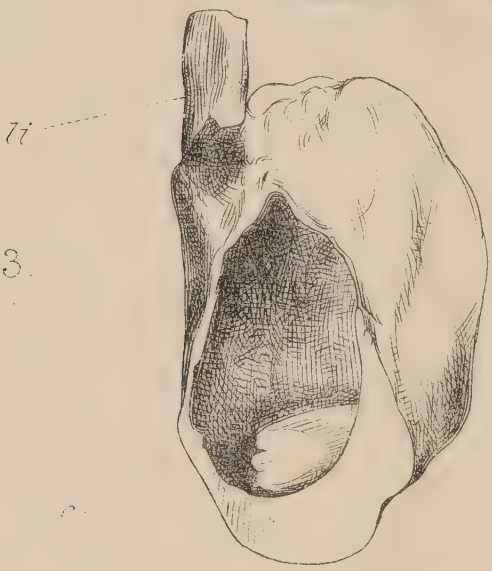


Fig. 3.

Fig. 4.

Wyman & Sons, del.

PATHOLOGICAL SERIES.

PLATE III.

DENTIGEROUS CYSTS.

FIG. 2.

SPEC. 100.—Dentigerous cyst from the forepart of the jaw of a sheep.

THE characters of this specimen are for the most part the same as of that figured on Plate I.; but the missing tooth in this instance has been preserved, and is shown in the figure lying upon the floor of the cyst. Its crown is in no respect abnormal; but the neck and root are rugged, and may perhaps mark the date of the commencement of the morbid process.

FIG. 3.

SPEC. 103.—Wax model of a portion of a human lower jaw expanded by a dentigerous cyst.

OWING to the nature of the enlargement of the jaw not having been correctly diagnosed, the portion here represented was excised by M. Maisonneuve, when a canine tooth was discovered lying horizontally along the floor of the cyst. The patient's age was fifty-six.

FIG. 4.

SPEC. 101.—Very large Dentigerous Cyst, from the forepart of the lower jaw of a sheep.

THIS specimen is interesting chiefly on account of size: it has, by pressure, distorted the other side of the jaw, so that during life it might have been thought that it was not limited to one side of jaw, to which, however, it really is strictly confined.

The membrane lining the cyst is preserved within it, as is also the misplaced tooth around which it was formed.

Plate 4.

EXOSTOSIS OF THE ALVEOLAR BORDER.

Fig. 1.

Fig. 2.

Wyman & Sons, del.

PLATE IV.

EXOSTOSIS OF THE ALVEOLAR PORTIONS OF THE JAW.

FIG. 1.

SPEC. $60_{i.}$—Model of an exostosis of the outer alveolar plate, opposite to the upper molar teeth.

Presented by G. ALEX, Esq.

IT was of slow growth, and caused little or no inconvenience: whether a similar growth existed on the other side is not known.

FIG. 2.

SPEC. $60_{ii.}$— Lower jaw, on the inner surface of which are several small exostoses (marked *a*).

Presented by J. TOMES, Esq.

THE nodular exostoses in the specimen present, to a certain extent, the usual character of bilateral symmetry, although those on the left side are somewhat the largest; it occasionally happens that the growth on one side increases to such an extent, that that on the other is, from its comparative insignificance, overlooked altogether. In both this and the preceding specimen, as is indeed often the case, all the teeth appear to have been perfectly sound; so that we cannot attribute the new growth to the irritation set up by diseased teeth.

GENERAL MONTHLY MEETING.

Monday, May 4, 1874.

CHARLES VASEY, Esq., Vice-President, in the Chair.

The Minutes of the previous Meeting were read and confirmed.

The following gentlemen were nominated for membership :—

Mr. Frederick W. Murray, Dublin, non-resident.

Dr. M. C. Darin, Chevreuse, France, corresponding.

The following gentlemen were elected Members of the Society :—

Mr. J. D. Holford, L.D.S., 14, Orchard Street, London, resident.

Mr. J. H. Longford, 13, Westmoreland Street, Dublin non-resident.

Mr. G. Lydden, L.D.S., 16, Forbury, Reading, non-resident.

The following Donations to the Museum were announced :—

Head of a Lion (stuffed), from Mr. Charles Vasey.

Model of a Case of Dental Irregularity, from Mr. J. Parkinson.

The TREASURER exhibited a war-horn, ornamented with human inferior maxillæ, brought from Coomassie; the specimen was interesting as showing, in the numerous teeth preserved, a total absence from any tendency to caries.

Mr. OAKLEY COLES.—In connection with the interesting specimen exhibited by Mr. Parkinson, I may say that I have had the opportunity of examining a skull brought from West Africa by a friend of mine in the Engineers, and in that case the whole of the teeth in the upper jaw, with the exception of the incisors and canines, were gone. The jaw-bone was evenly absorbed, so that the teeth had been got rid of and removed in some way for a considerable period. It may be interesting to have that evidence apparently in support of the existence of caries amongst the natives of the West Coast of Africa.

Mr. OAKLEY COLES, in describing a case of remarkable deformity of the upper jaw, associated with malposition of the teeth, said—"In November 1872, the subject of the present notice was placed under my care. The patient, a female, aged 18 years, presented a remarkable condition of the upper maxillæ. The two sides of the palate were at one point in contact with each other, and the second bicuspids had less than the eighth of an inch space between them; in other words, the one approached the other of the opposite side of the jaw to within that distance. The deformity that existed may be best described as an exaggerated example of V-shaped maxilla.

An examination of the accompanying engraving (fig. 1) will however show—better than words can describe—the deformity that existed. The outline of the labial surface of the jaw is essentially V-shaped. The buccal and palatine surfaces are in their peculiar conformation, I believe, unique. The incisors and canines are laterally compressed, the first bicuspids are *within* the range of the dental arch, whilst the second bicuspids

occupy an almost symmetrical position on either side of the median line.

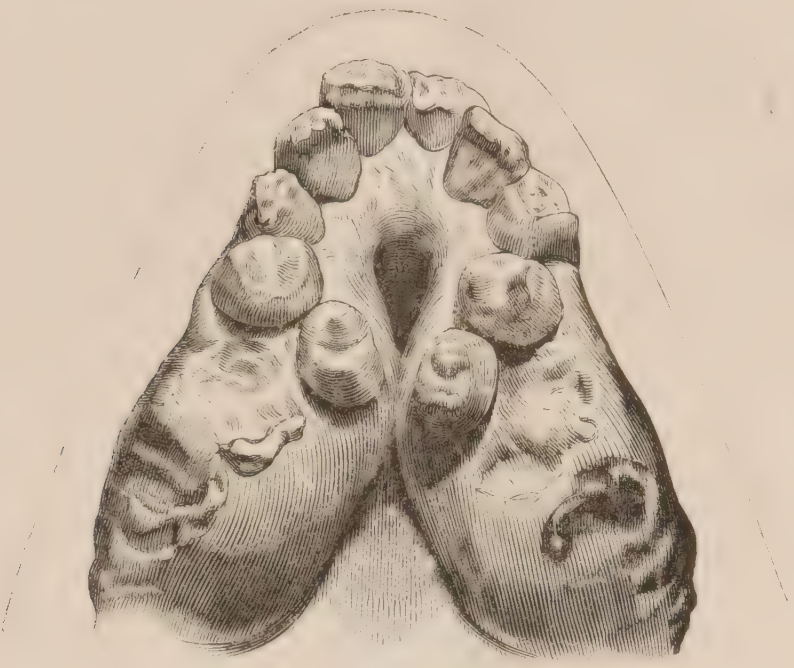


Fig. 1.

From a point midway between the two bicuspids on each side the molars are ranged in a line directed outwards and towards the angle of the jaw. The general arrangement of the teeth thus presents the appearance of a double triangle, the points of intersection being the first bicuspid teeth.

The lower jaw is large, and developed to a degree quite out of proportion to the upper maxilla. All the teeth, with the exception of the four upper bicuspids, are ill-developed, and indicate a strumous constitution. Between the upper and lower incisors, when the teeth were most closely approximated, there existed a space of three-eighths of an inch, the stumps of the upper molars articulating with the stumps of the lower molars.

The tonsils were enlarged, and the mucus ropy and unhealthy. The general intelligence was somewhat below the average. The inferior border of the lower jaw, instead of presenting

the ordinary angle, descended in a curved line from the articular to the mental region, thus giving a singular appearance to the face. The outline of the skull presented a similar compression to that found in the palate, though not to such a marked extent.

Treatment.—In November, 1872, I decided to extract the four upper bicuspid teeth, in order to produce absorption in the palatine region. This was done, and the result is shown in fig. 2, taken from a model obtained from the mouth fourteen

Fig. 2

months after the operation. At the same time a leather cap was made for the head, and attached to a chin-piece by elastic straps, with a view to altering the outline of the lower jaw. In this respect a marked improvement was noticeable, but for this fact I must ask you to accept my own observation as sufficient evidence, since the friends objected to photographs being taken. No mechanical appliance was worn in the mouth in order to widen the jaws, nor do I think that such an appli-

cation would have increased the space in the palatine region to a greater extent than that which has been obtained by simple absorption. This is a point, however, that must remain open to discussion, since it is difficult to obtain data of two precisely similar cases treated by the two different methods. With regard to the origin of the deformity at present under our notice, it is difficult to find a satisfactory explanation.

My own impression is, however, that it is due to the development of the molars acting upon the bicuspids at a date prior to their eruption; the influence of the molars over the position of the bicuspids being increased by the generally imperfect condition of the osseous tissues. As the molars have descended downwards and forwards, they have driven the bicuspids inwards and forwards. An examination of the casts suggests this view, and I see no reason for rejecting it, as an explanation of the abnormality.

The origin of the V-shaped maxilla may have been due to premature union of the premaxillary bones, or to cerebral hernia, or hereditary influence; on this point, however, I must not attempt to open a discussion, as it would take the present notice beyond the range of a casual communication.

Mr. Charles Tomes. — The specimen exhibited by Mr. Ranger at the last meeting, and which has been referred to me to examine, I am sorry I cannot say very much of; it is exceedingly peculiar. The first and second lower molars are worn down, not strictly on their grinding surfaces, but they are laid over on their sides almost horizontally; they have been excessively worn whilst in that altered position. The peculiarity of the specimen is that the teeth, very much displaced as they are, must have had a very firm hold of the jaw, or they could not have been worn down in this their altered position. There is nothing in the upper jaw to throw any light upon it; but the lower jaw does not articulate quite exactly with the rest of the skull; it is of a somewhat different colour, and, with my friend Mr. Mummery, I have doubts whether they belong to one another at all. There has been an

alveolar abscess round the roots of the teeth, but that cannot have loosened them to any great extent, as otherwise they could not have been worn down in their altered position. I believe the specimen has been already before the Society.

Mr. Ranger.—With regard to the different colour of the upper and lower portion of the skull, I think it may possibly be explained by the upper portion having been exposed to atmospheric influence, while the lower jaw was found imbedded in a sort of clayey or gravelly deposit, which would give it that peculiar appearance. The upper portion has been left exposed to the atmosphere, and has become whitened. It will be seen that this tooth does articulate with the lower jaw.

Mr. Charles Tomes.—I referred to the articulation with the condyles. You will find that the condyle does not articulate very accurately with the skull.

Mr. Ranger.—The skull was sent by a gentleman from New Zealand, and exhibited by Professor Busk. He thought that the parts corresponded; that the lower jaw did belong to the skull.

Mr. Mummery.—I confess that I am altogether unwilling to accept that lower maxilla as belonging to the cranium. I think the lower one belongs to a much more robust skull. Moreover I do not see anything in the upper jaw to account for the immense aberration in the lower.

Expanding Amalgams. By Mr. Thomas Fletcher.

The plugs forwarded for criticism are made with the expanding amalgam, an alloy almost identical with the well-known platinum amalgam, but possessing in a very perfect form many properties of value as regards the preservation of badly decayed and fragile teeth. In plasticity and smoothness when mixed, and in power not only of adapting itself perfectly to the walls of a cavity, but also of retaining its form whilst hardening, I believe it stands far above any other alloy at present known. These properties are clearly shown in the plugs, which are made not only of a very large size, but in the most unfavourable cavities I could possibly select. The specimens sent have been made from three to eight weeks, and have been in ink a week or more. The surface of the plugs in the glass cavities is as smooth and brilliant as the glass itself, and the plug in ivory will be seen to have penetrated into the texture of the material. In the large cavities in unannealed glass with broken irregular edges, the plug will be seen to be a perfectly moisture-tight fit in every part, showing a total absence of any tendency to alter in form and ball up whilst hardening. This fault is a very common one in amalgams, and I know no other alloy which is perfectly free from it under all circumstances.

Reference has been made to a comparison between this amalgam and Sullivan's; the latter is by no means free from shrinkage, and often alters considerably in form whilst hardening, in no case making a moisture-tight fit; its power of protection being purely chemical, from the formation of copper salts, which penetrate the body of the tooth and cause serious discoloration. The object sought with the expanding amalgam is to obtain under the worst conditions possible, a perfect moisture-tight fit, such as may be obtained in favourable cavities with a wedged plug of non-adhesive gold foil, and I think the plug sent will show that this can be done with ease and certainty. I shall be glad to make any further tests which may be suggested, or to supply the Society with means to do so. As

the composition of the alloy is known to several members, and as it so very closely resembles that of the platinum amalgam, the properties of which are well known, I should suggest that chemical tests are unnecessary, as there is little doubt that they will prove exactly alike; the only difference will be found in the mechanical properties, which are, so far as I can judge, peculiar to this compound, and of an extremely valuable nature in practice. I have made no test-plugs in teeth for criticism, as in very badly decayed fragile teeth the enamel is so readily penetrated by coloured solutions that it is almost impossible to keep the whole of the cavity clear unless the outer surface of the tooth is varnished over, and any small plugs in moderately decayed teeth are not sufficiently severe as tests for an alloy designed specially for use under the worst possible conditions. I have, however, made numbers of plugs in teeth for my own satisfaction, and shall be glad to make some and show them after being cut open, if the Society think it desirable, and to make also plugs of Sullivan's, or any other alloy under precisely the same conditions.

Mr. Coleman.—I am sorry that we have not time to discuss as fully as it deserves the subject Mr. Fletcher has brought before us. Two or three months ago Mr. Fletcher kindly sent me a small sample of this stopping, I believe when he had just succeeded in preparing it. I at once experimented in the mouth of a patient, who had no reason to complain, for that patient was myself. After this short interval of time the filling appears perfectly in contact with the walls of the tooth, and to have in no degree discoloured it; but I think it has shown some little symptom of wear. It appears to me that this filling may either undergo on its surface some action from mechanical wear, or else it may suffer a little in a chemical way. The best amalgams that we are at present acquainted with are those we may term binary compounds—the union of two metals, effected under the most favourable circumstances; for instance, we have palladium and mercury—mercury in a fluid state, and palladium reduced to a very fine state of division—an approximation to a fluid state. That this is not a

mere mechanical combination, but is certainly a chemical combination, is shown by the heat which is evolved when these metals are thus mixed together. The same thing takes place with precipitated silver and mercury, and also (though probably brought about under different conditions) in the case of the amalgam called Sullivan's—finely precipitated copper and mercury. It therefore appears a question whether the more complex compounds are likely to surpass in efficiency those which one might term binary compounds. I remember being struck with a remark of Mr. Makin's in the discussion upon his paper at our Society. He was asked by a Member whether it were not possible to form an alloy of gold suitable for making foil for the purpose of filling teeth, and he said he believed it could be done, and that very excellent alloys could in this way be formed; the only difficulty would be in insuring the absence of any other metal, for the presence of a third metal, however small in amount, would entirely spoil the whole result. It appears to me that that may perhaps be the case with regard to amalgams. But in reference to the short trial I have been able to make, with the exception of its appearing to wear or dissolve away, this new introduction of Mr. Fletcher's may, I think, be regarded as a valuable addition to our amalgams.

The Chairman.—The amalgam that the Messrs. Ash have supplied to the profession for a great many years proves to be a very serviceable one, and is, I am given to understand, formed of three metals, silver, tin, and a very small proportion of gold. I may ask, would the expanding amalgam be at all likely to injure incisor teeth with very large cavities where the dentine is entirely lost from under the enamel?

Mr. Sewell.—I have had a communication from Mr. Fletcher, in which he states that expansion is so extremely small, that it would not damage fragile teeth. He says that the expansion is not readily detected by the specific-gravity test. I think it would be well if that test were applied to a large mass of the amalgam, for if it do really expand, I cannot

conceive that the test should fail. The specific-gravity test can be made extremely delicate. Perhaps Mr. Charles Tomes, who has made some experiments with amalgams and their specific gravities, might make some experiments with this also.

Note.—We are requested to state that the Donation to the Museum announced in the March No. of the "Transactions," as presented by Mr. E. Holborow King, was presented by Dr. Martin, of Portsmouth.—[*Ed.* "*Trans.*"]

On Dentigerous Tumours of the Jaws, with Preparations and Drawings. By Mr. Thomas Bryant, F.R.C.S., *Surgeon to Guy's Hospital.*

Mr. President and Gentlemen,—I have the pleasure this evening of bringing before your notice some cases of dentigerous tumours of the jaws; and, by way of explanation, I must add that I do so on the invitation of your excellent secretary Mr. Sewell, who, from some observations I recently made at a sister society upon a case of tumour of the upper jaw, was led to think that out of my general experience I might be able to extract something which would throw light upon the subject of your special study, or failing in this, prove of interest; and I can only hope that in this expectation he will not be disappointed.

The subject I have chosen for consideration is full of interest; it claims the study of those who practise in your department of surgery as much as in mine; it ought to receive more attention than it has hitherto.

It is true, from time to time, cases have been recorded of cystic tumours of the jaws, more particularly of the upper, in which teeth have been found—teeth growing in an abnormal direction, or retained, and these have received the title

of dentigerous cysts; but my own observations have led me to suspect that a far larger number of cases of tumours of the jaws, more particularly in children, have their origin in malplaced or retained teeth; and that, if so, they are in their earlier stage more amenable to surgical control than has hitherto been supposed.

I do not propose, however, to occupy your time by enlarging to any extent upon the nature or peculiarities of that interesting class of cases known as dentigerous cysts. I feel confident that every dentist with every surgeon now recognizes their nature, and that you will endorse to the full the force of the following remarks. You will agree that a gradual and almost painless enlargement of a jawbone, met with in a young subject, or commencing during the period of second dentition, associated with the unaccountable absence of some permanent tooth or teeth, ought always to lead the surgeon to suspect the presence of a dentigerous cyst.

That when the expanded walls of the cyst yield to pressure, and furnish on manipulation the stiff parchment-like crackling, that suspicion should be strengthened; and when the swelling is situated at the region of the missing tooth, and emits a serous fluid on being punctured, the diagnosis is almost sure, its completion requiring only the direct evidence of the tooth's presence, which is alone to be gained by the free explora-

tion of the cyst's cavity. The following brief notes of three such cases may be of interest. Two occurred in my own practice, and the third I saw with my late colleague Mr. Poland.

Case I.

Dentigerous Cyst of the Upper Jaw; Operation and Recovery.

Reported by Mr. Rogers Harrison.

James J., a healthy boy, æt. 6, came under Mr. Bryant's care at Guy's Hospital, on March 5, 1868, for some enlargement of the left upper jaw. It had been gradually coming for three years, and had followed an injury received in a fall against a stone. In the fall the gum above the first left bicuspid tooth was cut, and for some days remained swollen. Since the accident the boy had occasionally experienced pain in the part, but it was never severe.

When first seen, the left upper jaw was much enlarged, its anterior wall, more particularly towards the nose, was very prominent; the palate process of the bone bulged downwards into the mouth, and the orbital plate was pressed upwards. The boy had changed some of his teeth, having cut the central incisors and double teeth, but not the lateral incisors and canine.

Mr. Bryant at this time made a puncture into

the tumour beneath the cheek, but blood alone escaped.

On June 18th the patient was admitted into the hospital.

On June 27th Mr. Bryant again punctured the swelling, when some serous fluid escaped. The nature of the case then became tolerably clear, and an operation was determined upon.

On July 24th the operation was performed.

The patient was brought under the influence of chloroform, and Mr. Bryant made a free opening into the anterior wall of the tumour beneath the cheek; he used a strong knife for this purpose. He then cut out a piece of bone half an inch square, and exposed a cavity, from which some serous fluid escaped. On looking into the cavity, near its nasal angle, the glistening surface of a tooth was seen; its crown projecting obliquely upwards. This was removed by means of an elevator, and it appeared to be the crown of the left lateral incisor.

(*Vide* preparation.)

A rapid recovery followed the operation. The boy leaving this hospital on August 13th. By October 6th the face was natural.

Case II.

Dentigerous Cyst of the Upper Jaw, connected with the Right Canine Tooth; Removal of the Tooth; Recovery.

Sarah D., æt. 12, engaged in service, was admitted into Guy's Hospital under my care, on January 24, 1872, for an enlargement of the right upper jaw. It had been coming for two years, and had increased gradually. Three months after its first appearance the right upper canine temporary tooth was extracted, and at a later period, when she consulted my colleague, Mr. Salter, who regarded the case as one of dentigerous cyst, the swelling was cut into. On admission into the hospital, a swelling in the region of the right upper jaw was very visible; it occupied its anterior and outer walls, and at the part situated above the right bicuspid and incisor teeth there was a prominent swelling, which felt tense on pressure with the finger, and looked semi-transparent (Pl. I. fig. 1). The patient had a complete set of teeth, except on the right side of the upper jaw, where the canine tooth was missing. The central incisor was slightly displaced towards the right, and the lateral incisor still more so, a gap existing between the two; a larger gap was also present between the lateral incisor and the first bicuspid.

On January 30th, with the patient under chloro-

form, I made a free incision into the swelling, beneath the cheek and above the gum, taking away the front wall of the cyst. Some serum escaped at the time, and the missing canine tooth was seen glistening in the exposed cavity; its crown was projecting upwards and inwards from the posterior part of the palate plate of the cyst. By means of forceps the tooth was then extracted. It was a perfect canine tooth, with a curved fang (Pl. I. fig. B).

Some swelling followed the operation, but in a few days it subsided, and the patient was discharged cured on February 11th.

Case III.

Dentigerous Cyst of the Lower Jaw; Operation; Recovery.

Mary F., æt. 26, a native of Rochester, was admitted into Guy's Hospital, under the care of Mr. Poland, on August 10, 1859, for some disease of the right ramus of the lower jaw. It had been gradually coming for two years, and appeared as an almost painless dilatation of the bone; the outer wall of the bone was, however, more involved than the inner.

The outline of the swelling was smooth, and it was supposed to be cystic. Under this impression Mr. Poland laid the cyst open from within the mouth, excising a portion of its wall and

evacuating its contents, which were serous. He then discovered at the bottom of the cyst a tooth, which he extracted, and a good recovery ensued.

Unfortunately the tooth has not been kept, but it was a double one.

With these brief observations upon the dentigerous cysts of the jaws, I will pass on to the more immediate object of this Paper, and ask you how far your experience will support me in the opinion that solid tumours of the jaws may originate from a malplaced or retained tooth.

That some do I have little doubt, for the cases I am now about to bring before you support the view; but how far such an influence may extend is an open question, although it deserves close consideration.

The first case that suggested the thought occurred to me in 1868. I attended it with my colleague, Mr. Bader, and Dr. Alfred Charlton, now of Tonbridge Wells. In it the growth apparently originated from a ridge of bone that surrounded an uncut double tooth; the tooth was clearly imbedded in its base, and was situated in the palate process of the diseased bone.

Case IV.

The early history of the case I give in my colleague, Mr. Bader's, own words:—

"Violet C., æt. $8\frac{1}{2}$, the youngest of six

children, came to me on November 6th, 1867, with slight protrusion of the left eye. This was observed first three months ago; it increased since. The retinal veins showed impeded blood-return from the ophthalmic vein; they were gorged; the eye and sight were otherwise healthy. About three weeks later an elastic nobby swelling appeared above the left lachrymal sac. This rapidly grew larger, displacing the eye more; the sight then began to fail.

"An incision was made over the most prominent part of the swelling, and a large quantity of a grey-red gelatinous substance removed from behind the eyeball and from the left antrum; there was little bleeding. The wound healed kindly, the protrusion subsided, vision improved. About two months later the protrusion reappeared, the sight failing again."

It was under these circumstances that I was consulted. On March 1st, 1868, I saw the child with Mr. Bader and Dr. A. Charlton. The disease at that time was apparently connected with the left upper jaw, the growth filling up the nose and pressing up the eye; it pressed the cheek likewise much forward, but had in no way altered the shape of the hard palate.

The child's health was tolerably good. An operation was determined upon, and on March the 4th it was performed. Mr. Bader kindly gave chloroform, and Dr. Charlton assisted. I

exposed the tumour by an incision made along the border of the nose and lower margin of the orbit, and turned the cheek back. I then freely opened the antrum with a pair of forceps, and with my finger detected the base of the tumour growing from the upper surface of the palate process of the upper maxillary bone. The whole bone was consequently removed without much difficulty. The operation was attended with very little bleeding.

The child passed a quiet night, having slept and taken nourishment well, but twenty-four hours after the operation it had a convulsion and died.

On examining the bones that had been removed, it was clear that the disease had sprung from the upper surface of the palate process of the upper jaw, and from a rough ridge of bone surrounding a double tooth. The tooth at its lower surface had partially cut through the gum and showed as a white speck, but it was imbedded in the centre of the base of the new growth. The growth had expanded the antrum and pressed into the nose and orbit, having caused absorption of much of the bone.

Unfortunately the preparation was lost, and no microscopical examination of the growth was made. It was, however, of a greyish semi-transparent granular character, and readily broke down under the finger. It did not appear to be of a cancerous nature, it having no juice.

Case V.

Myeloid Dentigerous Tumour of Right Upper Maxilla; Exploration; Excision of Portion of Jaw with Missing Tooth; Recurrence; Second and Third Operation; Recovery.

(Reported by Messrs. Hawton and Symonds.)

Susan G., a thin but not emaciated child, æt. 8, was admitted into Dorcas Ward on the 8th December, 1870, under Mr. Bryant's care, with a tumour in her right upper jaw. It extended outwards to a line drawn from the outer angle of the orbit obliquely upwards and inwards to the root of the nose; inwards to the middle line, encroaching on the right nostril and pushing the nose to the left; downwards to the alveolar border of the bone; it expanded also the right side of the hard palate a little over the middle line to within an inch of its posterior border; the bulging of the alveolus was more marked in the position of the right canine tooth (Pl. I. fig. 2).

The swelling was smooth externally and very hard; it completely occluded the right nostril, but did not interfere with the movements of either the right eye or the lower jaw. The teeth present in the upper jaw were, on the right side, the central incisor and lateral, an interspace existing between the two; first bicuspid, turned outwards;

Fig. II.

Plate 1.

Fig 1.

WYMAN & SONS, DEL ET LITH

second bicuspid; first temporary molar; first permanent molar. The canine tooth was missing, the lateral incisor occupying its position. On the left side the teeth were normal.

In the lower jaw the teeth were complete, with the exception of a stump of the first temporary molar on the right side.

December 16th.—For exploratory purposes, a puncture was made into the tumour beneath the cheek at a spot corresponding to the gap in the teeth left by the missing canine tooth, but a blood-stained glairy fluid alone escaped. The opening in the bone was then enlarged by means of bone forceps, and a cavity exposed, but no tooth was seen. The walls of the cavity were, however, very thick in all directions.

The patient vomited after the operation, bringing up about two teaspoonfuls of blood; the following day the soft parts were swollen.

19th.—The swelling was subsiding; a little oozing from the wound was present, but this ceased two days later; there was then no pain in the part on pressure, and the tumour was softer.

23rd.—The swelling had rather increased, and extended over the angle of the jaw; there were also some enlarged glands under the jaw. The child complained of pain when the tumour was touched, and looked very pale.

January 7th.—The removal of the bone was arranged.

10th. *The Operation.*—The patient was put under the influence of chloroform, the central incisor tooth was drawn, and an incision made in the middle line of the upper lip, horizontally round the nostril, up the side of the nose to the inner angle of the orbit; the soft parts were then dissected off the upper jaw, the alveolar process cut through in the median line, the nasal process divided, and a section made with the saw of the tumour where it joined the malar bone; the mass was then seized with the lion forceps and a portion broken off (Pl. III. fig. 1), the forceps at the time rasping what turned out to be the missing canine tooth, the fang of which was in close contact with the orbital plate of the maxillary bone; the tooth was imbedded in a mass of dense bone (Pl. III. fig. 2, A).

The points of bone were then cut off to make a smooth surface, and the soft parts adjusted with a continuous suture. A mass of new bone, which occupied the seat of the nasal process of the maxillary bone in which the canine tooth was imbedded, was left, Mr. Bryant thinking that it would be reabsorbed, now the misplaced canine tooth was taken away.

11th.—Patient did not sleep during the night, and complained of pain in the part; some blood had oozed from the nostril for two hours after the operation, when it ceased. She did not sleep the following night, and on the 13th the cheek

Fig. 2.

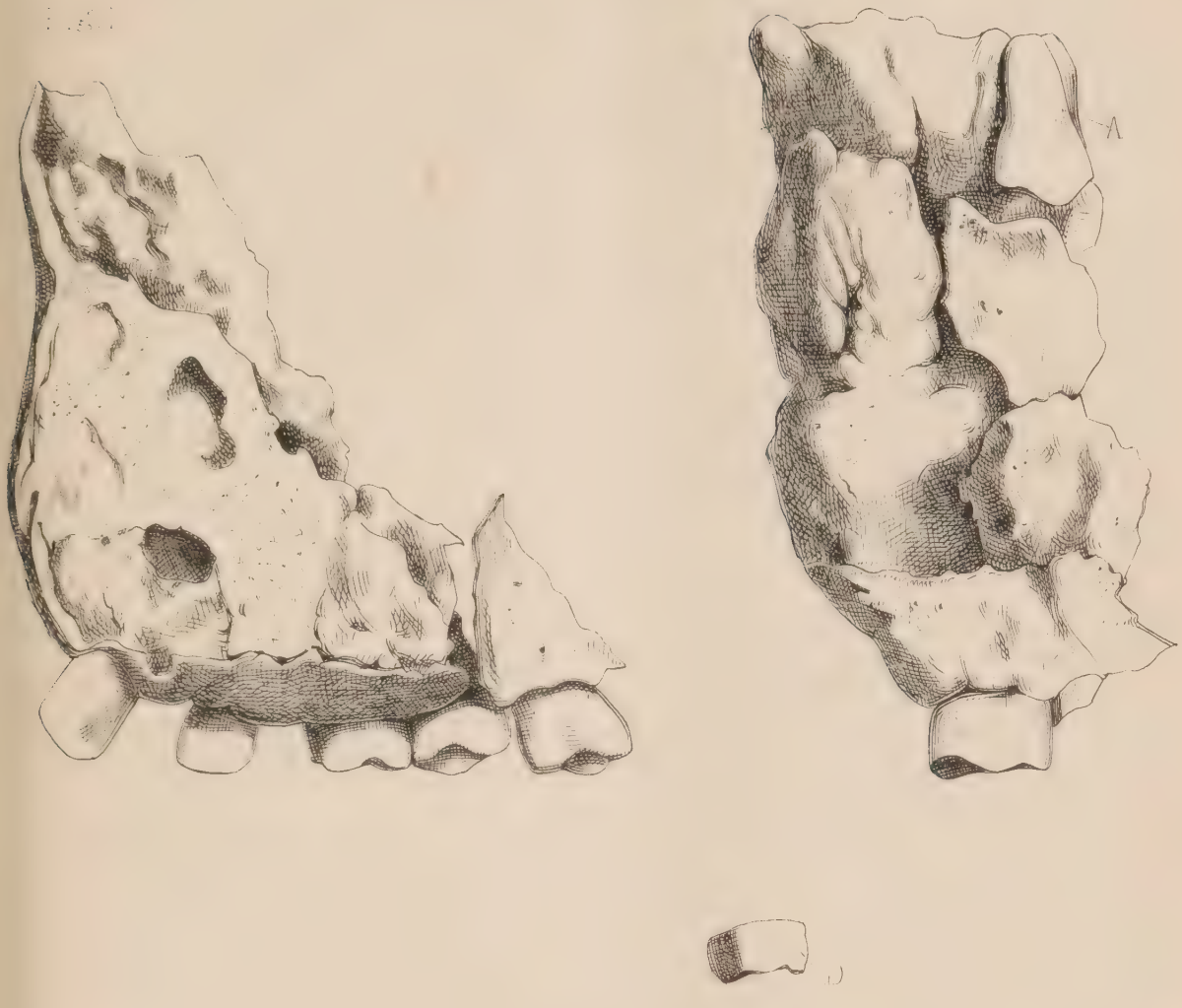
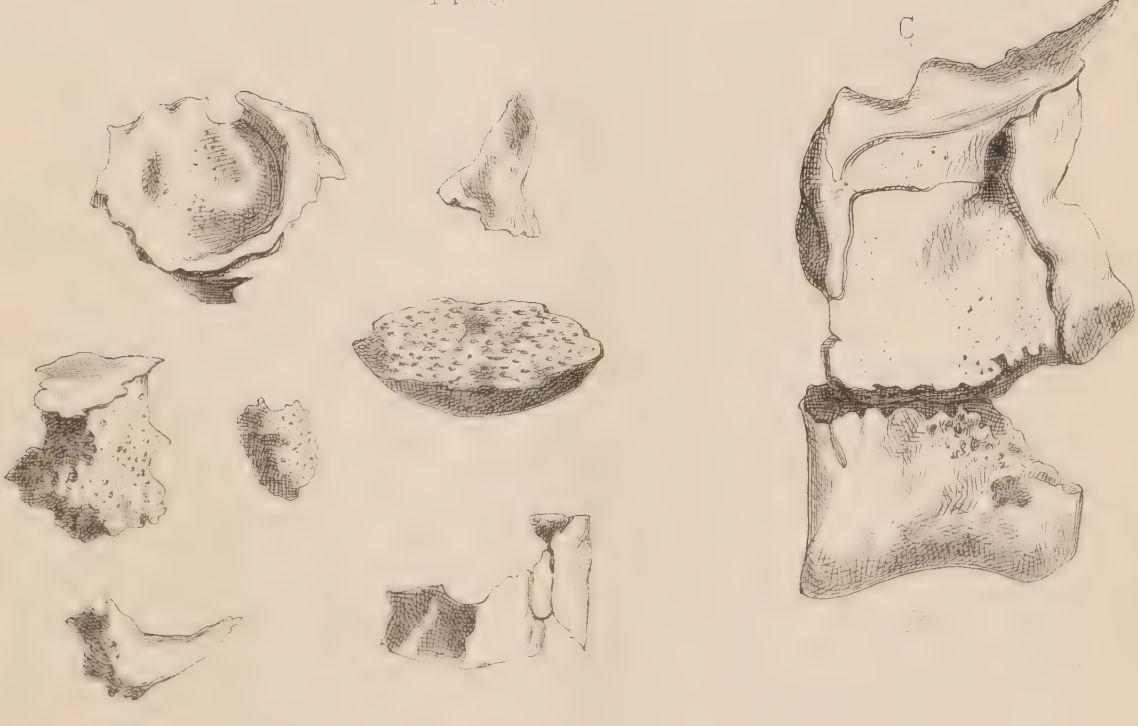


Fig. 3.



WYMAN & SONS, DEL. ET LITH.

under the right eye was swollen, nearly closing the eye; the skin was red, but there was no pain on touch.

14th.—The stitches were taken out of the wound, and two days later the wound had healed, the cheek being a little swollen.

17th.—The swelling remained. The child was in no pain, and slept well. The cavity was syringed out daily with Condy's fluid.

18th.—The wound had healed by primary union; the patient could breathe freely through the right nostril. Some cotton-wool was introduced beneath the cheek to keep it from sinking.

22nd.—The cavity was syringed out daily; the line of union was still slightly perceptible.

25th.—Sensibility was restored to that side of the face on which the tumour was situated.

31st.—The line of suture was still perceptible; the cavity was syringed out daily; there was a plentiful discharge of healthy pus.

March 2nd.—Mr. Salter fitted an apparatus in the mouth, which it was thought answered very well, and on the 8th she left the hospital.

August 8th, 1871.—Susan G. was readmitted into the hospital, the tumour on the right side of the bridge of her nose having grown. There was a distance of two inches between the eyes, the right being encroached upon by the tumour; the movement, sight, and position of the right eyeball were not affected. The right ala of the nose was a

little lower than the left, and the whole nose seemed pushed towards the left side; the right angle of the mouth was a little drawn upwards. (Pl. II. fig. 1.) There was the scar left by the incision of the first operation. She said she could not blow through her right nostril. On looking up the nostril, the point of occlusion could not be seen; both nostrils were narrowed. On looking into the mouth, the hard palate seemed entire on both sides; the alveolar process of the right superior maxilla was entirely absent; there was a little ashy-looking spot about the middle of the margin of the right hard palate, where the child said the false palate that was devised pressed. The apparatus did not remain firm in position; when it was out of the mouth the right cheek fell in a little. The patient could speak very well, but she was not capable of mastication.

She was fairly nourished, and seemed cheerful.

29th. *Second Operation.*—Chloroform was administered, and a bistoury was passed through the upper lip from the inside; the lip was divided in the line of the former operation, and a cut made along the nose to about half an inch of the inner angle of the right eye, following the course of the former incision; the tissues were then reflected from the cheek, and the right ala of the nose lifted up. The handle of the scalpel was then introduced near the root of the nose, and a bony cystic growth separated and lifted out. The surround-

Fig. I.

Fig. II.

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ing parts of bone were chipped away by cutting forceps. A large cavity was thus exposed. Bleeding was arrested by torsion and the application of Tinct. Ferri Perchlorid.; the edges of the wound were brought together with silk sutures. The following day two sutures were removed from the lip, the edges having united. The patient had a little vomiting, but slept well during the night. There was a discharge mingled with blood from the right nostril; the skin over the right cheek appeared red and bright; the right eye was partly closed. Pulse 138, temp. 101°·8.

The growth removed was made up of firm fibrous tissue, enclosing numerous small cysts, the septa at parts becoming osseous. One side was covered by a bony plate, and one or two smaller bony plates were also removed.

31st.—Pulse 120, temp. 101°·4. The right side of the face was rather more swollen; the skin was red, but not so bright; the right eye was closed, and a little discharge oozed from beneath the lids; the discharge continued from the right nostril, but it was not mingled with blood; it also came from the mouth.

The patient had taken some broth, also an egg. She had slept well, and did not complain of pain, but seemed very dull.

September 1st.—Pulse 114, temp. 100°·1. Poultices were applied to her cheek.

4th.—The dressings were removed; some discharge existed.

9th.—The wound had healed, with the exception of a small sinus at the upper part. Three days later the child got up, and on the 19th the wound had quite healed. She left the hospital on the 29th of October, having had a set of teeth made, and fitted in the position of her right upper jaw (Pl. II. fig. 2).

The patient was again readmitted on the 25th January, 1872, her friends being under the impression that there had been lately more swelling by the side of the nose. It was noticed also that the tears did not pass down into the nostril as the child cried, but over the cheek. When the child was not crying, the secretion did not flow over the cheek. Both nostrils were partially obstructed, and the child breathed through them with difficulty. The obstruction on the left side was due to the displacement of the septum.

No interference at this time was thought requisite.

November 18th.—By this time the tumour had evidently much increased, and a third operation was suggested. Mr. Bryant proceeded to remove the recurrent growth by reopening the old incision in the median line of the upper lip and along the right ala of the nose upwards to the inner angle of the eye. He then made a section of the bone with a saw in the median line of the jaw, and turned back with a raspatory the soft parts that covered in the palate portion of the growth. He removed

the bone piecemeal; one large piece corresponded to the alveolar process, the median section of which was thick and soft (Pl. III. fig. 3, B). The rest of the hard palate was removed with the right palate bone and part of the internal pterygoid plate (C). Other pieces of disease were removed from somewhere in the region of the ethmoid and sphenoid bones. The crown of a molar tooth fell out of the growth during its removal (D). The hole left after the operation appeared as a large gap, in which neither nose nor mouth had any special separation; the whole formed one cavity. No hæmorrhage of importance took place.

The soft parts which had been turned back from the palate surface of the growth were then brought up and stitched to the mucous membrane lining the cheek, and in this way a complete palate was formed; the incision on the face was carefully brought together by fine sutures.

19th.—Temp. 101°, pulse 136. Passed a good night.

20th.—Temp. 100°, pulse 124. Doing well; takes food well.

21st.—Temp. 101°·8, pulse 124. There is some œdema of the left eyelids.

24th.—Temp. 100°·8, pulse 124. The wound has healed; sutures removed, palate perfect.

25th.—Doing well.

26th.—Patient able to eat soft food.

December 3rd.—The parts have all healed, and

on examining the interior of the mouth, the nostril is found to be completely shut out from the mouth by means of the mucous membrane flap which had been retained.

11th.—The patient is up and about the ward.

20th.—Patient convalescent.

Report by Dr. Goodhart.

"The parts removed at the third operation consist of the posterior part of the hard palate with the right palate bone tuberosity; some smaller pieces, with thin plates of bone projecting at angles from the main plate, and having the appearance of ethmoid; and some dark red soft material as well. Most of the bone, except that portion of the hard palate removed, is very soft and spongy, the cancelli being filled out with a plentiful supply of dark red substance similar to the soft parts of the growth. This is seen as well on the cut surface of the new bone, towards the median line, as in the deeper parts, so that it must be taken as proved that part of the growth extends across the median line and has been left behind. The thin plates which appear to belong to ethmoid, or possibly to the lower wall of the sphenoidal sinuses, are healthy, so that in this direction backwards the growth has not extended.

"A microscopical examination of the growth in its recent state showed its embryonic nature.

Fig. 1.

Fig. 2.

WYMAN & SONS, DEL. ET.

What stroma there was, appeared to me to be formed by spindle cells of varying size, while in the meshes thus formed, and which were easily destroyed by the isolation of the component cells, were large myeloid cells, and also granulation-like cells, with a large, sometimes single, sometimes double nucleus. The myeloid cells were crowded with nuclei (Pl. IV. * figs. 1 and 2). The bone in the tumour appears to be good bone. It will thus be seen that, though belonging to the class of myeloid sarcomata, it had so much of the spindle-cell type that I at first thought that such was its true nature, and it is at least open to conjecture still as to the proper nomenclature of such a growth. Is it that we have here a spindle-cell sarcoma manifesting a tendency to the production of myeloid cells by reason of its occurrence in a young person? Is it that the growth, originally from the medulla of the bone—a myeloid growth—is so rapid in its development that we see in it only a mere wreck, or rather a shapeless mass—shapeless, I mean, not only in its aggregate as the tumour, but in its ultimate atom, the single cell, which is without any constant form?

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* Fig. 1. Myeloid sarcoma, to show the relation of the myeloid or giant-cell to the surrounding round-cell sarcoma tissue.

a. Round-cell sarcoma tissue.

b. Myeloid-cell.

c. Capsule of cell. $\frac{1}{5}$-in. object. Camera. See also Plates III. and IV.

Fig. 2. Varying forms of cell, as seen in this and other myeloid tumours. $\frac{1}{5}$-in. object. Camera.

Or is it that we have a bone growing here—not one part of the bone, as the medulla or lymphatic tissue or periosteum, but the whole group of tissues making up bone—all involved in this whirl of aberrant development? Such questions, of passing interest, as it seems to me, in the life-history of this and all tumours, I cannot answer. I had almost said to settle them would be to destroy much of the interest which such diseases excite. The fact that much of this tumour has formed good bone, however, may be thought to disprove, at any rate, one of these conjectures."

Remarks.—This case is a very remarkable one, and in its pathology not quite clear. From its history and treatment several important practical points are to be gathered, which are worthy of attention.

The time of life at which the disease appeared, the absence of the canine tooth, and the almost painless character of the swelling, suggested at once the idea that the tumour was due to a malplaced tooth, and the probability that the swelling was merely a dentigerous cyst, such as I have recorded, was the first natural thought. A closer inspection of the case, however, did not encourage this idea, for it will be seen by the drawings that, whereas in the case of dentigerous cyst (Pl. I., fig. 2) the swelling occupied the lower border of the maxillary bone, in the case just recorded the whole of the bone was involved in

the disease, and more particularly its nasal process (Pl. I. fig. 1). Nevertheless, I thought it right to explore the tumour before I undertook its removal, and with that object carried out my first operation.

The information I gained by this exploratory operation was, however, negative; a cyst, or rather cavity, was opened, which was surrounded by dense bone, but no tooth was found.

The second operation was therefore planned, and the extirpation of the jaw was its object, for I hardly realized the idea that such a solid tumour as the one I had to deal with appeared to be, could be the result of a malplaced tooth, although the possibility of this being the case was before me. The truth, however, came home to my mind at the operation, when the rasp of the bone forceps against the canine tooth, situated below the orbital plate of the bone I was removing, revealed its nature. I regarded the growth, however, as an inflammatory one, and upon such a supposition I was induced to leave the portion of the growth that occupied the nasal process of the superior maxillary bone; for I naturally thought that if the disease were inflammatory, and due to a malplaced tooth, the inflammatory thickening would subside on the removal of its cause—the missing canine tooth; and this had been taken away with the thickened bone (Pl. IV. fig. 2). In this view, however, I was clearly mistaken, for the subse-

quent increase of the disease that was left, as described in the report, called for a second operation.

At the second operation I removed what I believed to be all the diseased tissue, for I could not make out the presence of anything that looked like infiltrated or thickened bone; but in this I must have been wrong, for the recurrence of the tumour within six months, and its subsequent steady growth, necessitated a third operation sixteen months after the second; and looking at the case pathologically, I fear another operation may yet be demanded, for on reading the pathological report by Dr. Goodhart, it will have been observed that the section of the palate and alveolar portions of the bone was infiltrated with the myeloid elements, and it is consequently to be feared that these may multiply. I shall therefore watch the case with care, in order that, on the first appearance of the disease in the bone of the opposite side, its speedy removal may be effected.

On looking back upon the case, it would therefore appear that the opinion I originally entertained of its nature was the correct one—the disease was not a simple inflammatory enlargement of the bone, due to a local central irritation, but a new growth, a myeloid sarcoma; and this new growth, in all probability, had been set up by the presence of a malplaced tooth.

Case VI.

The preparation I now hand round (1091, [15], Guy's Mus.) was taken by the late Mr. Aston Key from a woman, æt. 29, in whom the disease had been coming for nine years. The disease was of a fibro-cartilaginous nature, and involved the horizontal ramus of the lower jaw. Some teeth are seen to occupy a position in the centre of the growth.

Case VII.

The last case I have to record is one of great interest; it occurred, like the former, in the practice of Mr. Aston Key. The only details I possess of it I have found in the Guy's Hospital Reports for 1847, p. 163.

"The patient, a girl, æt. 18, had a large tumour, occupying the place of the lower jaw on the right side, and much disfiguring the face; it was generally believed to be malignant. It had been coming for twelve years, having first appeared when the girl was six.

"The operation was performed in 1846, under the influence of ether, by an incision carried all along the ramus; half the jaw was taken away, from the symphysis to the articulation. The part removed appeared healthy at each end, but in the middle it was widely detached, there being four or five large cells between the internal and external

plates of bone, and which appeared like expanded alveoli, all of them contained fangs of teeth. These cells contained a glairy fluid.

"The disease (writes the reporter) approached that which is called by some authors spina ventosa. The case went on favourably, and a good recovery ensued."

These, Sir, are the facts I can bring before you to support the views I have expressed,—that solid tumours, like the cystic, may owe their origin to the irritation of teeth delayed in the cutting or otherwise; and I think they are sufficient to justify this opinion.

In the case of the child æt. $3\frac{1}{2}$, in which the disease originated from a root connected with a ridge of bone that surrounded a double tooth situated in the palate plate of the upper jaw, it was difficult to come to any other conclusion; and in the last case I have recorded of Mr. Key's, in which fangs of teeth were found in the large cells that expanded the lower jaw, the same remarks are applicable.

How far you may be disposed to think, in the two other cases I have recorded, the tumours respectively owed their origin to the irritation of the teeth they contained, I do not know. You may possibly think that the teeth were only mechanically retained in their normal position by the new growth, and that by the disease the

cutting of the teeth was simply retarded, and I must admit that the facts I have before me are not sufficient to controvert that opinion. Still, taking these two cases in connection with the former, I believe they are of value.

In the production of the so-called epulis, a disease of the gums or periosteum, it is admitted that the irritation of diseased teeth may have some influence; and with this admission I can see nothing beyond reason when I ask you to assume that displaced teeth, or teeth delayed in their cutting, may have a like power in starting an endostial disease. For my own part, I am free to confess I have a strong impression that the bulk of the cases of cystic tumours of the jaws, dentigerous or otherwise, owe their origin to the irritation of the teeth, and I think the cases I have had the pleasure of bringing before you this evening are enough to suggest the thought that many of the more solid tumours have a like exciting cause, and, if so, surely some practical deduction in the treatment of these cases is to be drawn; and with all deference I would suggest it to be this,—that all jaw tumours originating at an early period of life, or before dentition has been completed, should be dealt with in an early stage; that they should be explored by perforation and excavation; that they should be attacked from their centres and not from their periphery; that they should be scooped out, not excised.

Discussion.

Mr. Charles Tomes.—I have heard with great interest Mr. Bryant's remarks, in which he has attributed to misplaced or retained teeth the origin of tumours of the jaw, other than those ordinarily known as dentigerous cysts. But there is a point upon which I should like to ask his opinion. Does Mr. Bryant agree with Professor Broca, who puts down for the origin of almost all solid tumours of the jaw, which are distinctly limited, some disease in the forming tooth. For instance, the ordinary fibroma of the jaw which now and then seems to be almost encapsulated, completely limited, and not to blend into the surrounding tissues, Professor Broca attributes to disease originating in a tooth-germ. And he also attributes to the same cause many of the so-called myeloid tumours occurring in young people, springing up during the period of tooth-development, while the tooth-germs are in a state of active growth. Professor Broca bases a good deal of his argument on the fact that you find in these myeloid tumours occurring in young people and during tooth-development, little round granules of lime-salts, the onion-like bodies that one does find in young tooth-pulps. But there was a little tumour shown at the Society a short time since by Mr. Francis Mason—a small pedunculated tumour of the gum, springing up between two sound teeth, which was full of these little bodies called "calcorpherites," by Professor Harting, and one or two others who have investigated the crystallization of lime-salts in presence of organic matter. Professor Broca has laid great stress on the occurrence of these little onion-like bodies of lime-salts; but their occurrence in a little tumour like that shown by Mr. Mason, would alone be sufficient to invalidate his argument to a very great extent. I do not exactly at this moment recollect what line Professor Broca draws between tumours which he would attribute to tooth-formation, and tumours which he would not attribute to that cause. At all events, he includes the great majority of tumours of the jaw,

which are distinctly limited and do not blend into the neighbouring tissues, to that cause.

Mr. Coleman.—I was about to ask a similar question to that of the last speaker, viz., whether Mr. Bryant went so far as Professor Broca in his views with regard to the origin of tumour of the jaw. It appeared to me, on reading his monograph on odontomes, that he really seemed to attribute to a dental origin almost every distinct tumour of the jaw—every tumour distinctly separable from other parts. But I certainly am of opinion, as far as my observation has enabled me to form one, that he carries his view upon the subject rather too far. I think that the ground taken by Mr. Bryant with regard to these solid dentigerous tumours is one that he is fairly entitled to maintain. We frequently find, in connection with diseased teeth, cystic tumours; and we likewise find fibro-cellular growths under the same conditions; so that if a retained or misplaced tooth give rise to the former—although we must, I think, accept the explanation of their origin under these latter conditions given by Mr. Tomes, sen.—it is a fair inference that it may, under certain conditions, give rise to the latter also. In confirmation of this I may mention that, some years ago, I removed from a gentleman a misplaced wisdom-tooth, which had given rise to symptoms of jaw disease for twenty-four years previously. When removed, it had attached to it a growth of its own size of fibro-cellular structure. Whether the whole of that growth came away with the tooth I am unprepared to say; I am inclined to think it did not. However, the removal of the tooth was attended with very marked benefit to the patient. The subject of the paper is one of considerable interest for us, as we, from our daily observation of the dental organs, may be often able to solve a doubtful case by being able to state whether or no a tumour may, or may not, have its origin in a delayed or misplaced tooth.

The President. — We have a member present to-night whose experience will be very valuable to us. I mean Mr. Tomes, sen.

Mr. Tomes.—I have scarcely anything to add to that which Mr. Bryant has already stated this evening as regards these cysts. In the course of my career it has been my habit to collect everything I could that was at all abnormal. The thing that strikes one is the vast number of jaws in which teeth were abnormally placed without producing any mischievous results. The preparations collected, I think, are for the most part in the museum; and if they were gone over, I am sure members would be astonished to see how many cases there are of malposition of the teeth that has occasioned no mischief whatever. As regards that particular form of dentigerous cyst which is filled with a transparent fluid, it has always occurred to me that, in the cases I have seen, the fangs had been implanted in a healthy condition, and that the enamel had been good, but that the collection of fluid had really arisen between the enamel and what one may call the remains of the enamel-forming organ; that, so soon as the tooth was completed, the fluid seemed to separate the enamel from the tissues surrounding it; and that, under certain conditions, it collected, and the bone giving way expanding in presence of this production, thus giving rise to the cyst. But the opening of the cyst and the removal of the tooth is sufficient to restore a healthy condition, and the disease very speedily disappears.

Mr. Barrett.—Speaking on the text of Mr. Tomes, one may feel that it is a question of very great importance to decide in which of these cases it becomes necessary to operate, or whether it is necessary at all. It must have occurred to all of us to have seen cases very similar to those described this evening; I speak rather of the minor cases than of the major case; and following out their history we have known them disappear without any operation whatever. I remember the case of a lady some six or eight years ago, who at the age of 30 suffered extreme pain in the neighbourhood of the upper portion of the nostril. She consulted some surgeons of England, who had difficulty in accounting for this. She went to Paris, when her nose became extremely large; the tissues in the neighbourhood of the antrum also were enlarged; she consulted M. Nélaton, who advised the injection of a fluid, which produced great pain.

She told me it was so intense that she remained unconscious for some days. Ultimately she recovered, and the swelling decreased. When she returned to England she related the case to me, and on examining her mouth I found a canine tooth projecting through the hard palate about half an inch behind the incisor teeth. From the previous history of the case I have little doubt that this tooth was the cause of the mischief. She had undergone one minor operation by a surgeon in London with the idea of relieving the lachrymal duct, as it was imagined that the origin of the disease was in that situation. I may also refer to another case occurring in a hospital in which a very severe operation was performed, and in which a dentigerous cyst existed. I was able to discover a portion of an inverted bicuspid in the mass that was removed. I need hardly say that when these operations are performed (I have no doubt that in Mr. Bryant's case the operation was performed for the best possible reasons), they often involve a considerable loss, if not the entire loss, of masticatory power, which no dentist can restore. It therefore becomes a very important matter to decide when any operation is necessary.

Mr. Sewill.—There is a simple point of practice arising in regard to these growths that perhaps might be mentioned, and that is, whether we shall recommend patients to have temporary teeth extracted, which apparently prevent the eruption of permanent teeth. Cases in which temporary teeth are retained occur among a large number of patients; they are seen in hospital practice almost every day. In some of these cases the permanent teeth are retained by the temporary teeth being held in their position owing to the approximation of the neighbouring permanent teeth. I have seen several cases of temporary molars apparently firm, which, on being removed, were found to have no fangs, they having evidently been wedged between the permanent teeth, and beneath these teeth sometimes a permanent tooth has been visible, ready to make its appearance as soon as the obstacle was removed. I think in the case of temporary molars, there might be no hesitation in removing them so as to give the permanent teeth a chance of coming through. When the temporary teeth hold a per

manent position in front of the mouth, it is rather hard to persuade a patient to have them removed. I have a model of the case of a young lady whose mouth I have had under observation for some years. In that case the temporary canine teeth remained, the permanent lateral teeth are not in position, the permanent canine teeth are perfect on one side of the temporary molar, and no bicuspids have been erupted in the mouth, so that there are six teeth still buried in this lady's jaw. The temporary canine teeth are very firm, and it would be a great disfigurement to have them out. One can understand in a case like that, where there are six teeth in the jaw, that a morbid action might be set up, and one of these growths be produced. The practical question is, as to the extraction of these temporary teeth. There is no doubt that formidable operations are sometimes performed in these cases which might be prevented had a dentist been consulted. Not long ago a case came under my own observation in which a very formidable operation was performed, which probably might have been found unnecessary had the case been first carefully explored. The dentist of course can tell which teeth are temporary and which are permanent, and so forth. I must say, for myself, that I feel under a great obligation to Mr. Bryant for reading his paper at my invitation. I am certain that the Society is not disappointed in either of the two points to which he alluded at the commencement.

Mr. Moon.—In connection with the remarks of the last speaker, it may be interesting to mention that I have a case I am now watching at Guy's, of a child nine years old, who is retaining all the temporary teeth. She is doing so, because she has an edge bite, and the opposing pressure of the teeth seems to be counteracting the absorption which would otherwise go on at the roots of the teeth. I may also refer to another case that I have never mentioned, in which there was a fistulous opening above the first permanent molar on the left side in a young girl of a perfectly healthy appearance. This fistulous opening when I first saw it had existed for some six months or a year, and pus had constantly flown in large quantities; the molar tooth above was perfectly sound. I was called in by a surgeon, who thought

there was something wrong with the teeth, and wished me to decide the question ; I found the tooth sound. On passing a probe into the fistulous opening, it passed into the antrum far up, in fact quite up to the top of the antrum. On taking out this sound tooth, it appeared to me that the fistulous opening and the formation of pus had resulted from the elongation of the roots of the molar tooth having excited inflammation as it passed into the antrum. I am not aware that there is another such case on record.

Mr. Bryant.—I have to thank the Society for the way in which they have received my communication, and particularly for the remarks which the communication has elicited. With regard to the question that Mr. Tomes and Mr. Coleman have put to me, I may say that I do not, in any way, coincide with Professor Broca, who is disposed to regard all tumours of the jaw as due literally to some tooth-irritation. I guarded myself against such a supposition by saying that I only alluded to tumours occurring in early life during the period of dentition, many of which might fairly be looked upon as having some connection with a tooth-irritation ; but in the case of tumours—fibrous tumours and others—occurring in adult life, when all the teeth have been cut and there is no such source of irritation existing, it is ridiculous to think of assigning them in any way to such a cause. Only recently I have seen a splendid example of encysted fibrous tumour of the lower jaw occurring in a man in middle age, and having nothing whatever to do with dentition. It is true that the tumour itself approached the teeth and pushed them out, but the teeth were entirely above the border of the tumour. The tumour had originated in the body of the lower jaw itself. I have also seen, in a patient of middle age, a small fibrous tumour nucleated in the dental canal, and having nothing to do with dentition ; in it the teeth were quite out of the way of the tumour ; the tumour was in the canal pressing upon the dental nerve, and could not have been caused by tooth-irritation ; so that, although I am disposed in a great measure to look upon the solid tumours of the jaws, upper and lower, as due to tooth-irritation when they occur in early life, I consider that

cause is quite out of the question when they occur after middle age, or after the cutting of the permanent teeth. The principal point to which I wished to draw the attention of the Society, was the advisability of interfering early, for in suspicious tumours I have often felt it was a pity that such cases were not dealt with at an early period, because in the case of a solid tumour connected with retained or malplaced teeth we can surely do the patient very little harm by an early interference, whereas we must do an immense amount of harm by allowing the tumour to enlarge, and so destroy one or other jaw, and necessitate its removal. With regard to the dentigerous cysts, some of Mr. Barrett's observations rather surprised me; but perhaps I may have been wrong in the interpretation I put upon them; I gathered, however, that he thought it, as a rule, wiser to leave them alone; and that even such cases as those that I have brought before the Society to-night might have completely recovered without any surgical interference. I can well believe that the presence of a simple cyst connected with a retained or malplaced tooth might undergo a natural recovery, and that the tooth might eventually, at some late date, find its way down into the mouth, or somewhere near where it ought to make its appearance, as in the case that Mr. Barrett has recorded; but I cannot understand how a natural cure can take place where the teeth are malplaced, and projecting in a wrong direction. In one of the cases I have recorded the lateral incisor was projected upwards from the floor of the mouth, and in the other case the canine was projecting upwards and backwards. I do not know by what process those teeth could become inverted again, and so assume a normal position. I am at a loss, therefore, to understand how a natural cure could take place under such circumstances by expectant treatment. I should have been glad to have heard a few remarks from some member of the Society with regard to the cysts that are found in the upper jaw which are not purely dentigerous, that do not contain teeth, and appear to be quite separate from the teeth. I have seen a few such cysts connected more particularly with the upper jaw. One occurred in the case of a woman of middle age, who came to me for some deformity of that bone, and I found on examination that she had an

enormous cyst connected with the upper jaw, which appeared to have sprung originally from outside the antrum. It clearly was not in the antrum, but it had very gradually pressed the antrum in; and, instead of the upper jaw presenting a convex surface externally, it presented a concave one; and at the base of what would represent the floor of the cyst were the fangs of some four or five permanent molar and bicuspid teeth. I confess that I did, in a measure, attribute the formation of this large cyst to the irritation of these fangs of teeth that had projected through the alveolus into the bone of the upper jaw. The alveolus was very projecting, and the body of the jaw was rather narrow, so that these teeth might really have appeared outside the body of the jaw in a great measure, and not towards the centre of the jaw. It has occurred to me, in five or six instances, to open such cysts as these connected with the upper jaw, and to find at their base a fang projecting. It has therefore struck me, rightly or wrongly, that these cysts might literally have originated from the irritation of the fang of the exposed tooth. The observation that Mr. Moon has made rather supports that view, because if you get a cyst in the body of the upper jaw due to the irritation of the fang of a cutting molar, we may also get expansions or growths connected with fangs of teeth in other parts. The observations made by Mr. Tomes with regard to the development of these dentigerous cysts were remarkably good, and I think we must accept his explanation as the true one; but these other tumours to which I allude are not true dentigerous cysts. They are cysts having some connection with the teeth, but not essentially developing teeth. I do not know whether I shall be in order, but I should like to ask Mr. Barrett whether I understood him rightly, and if he stated that he has known great injury result in regard to mastication from such a simple operation as opening a cyst above the alveolar process. I think I must have misunderstood him, for surely the simple opening of a cyst above the jaw could not have such an injurious effect upon mastication.

Mr. Barrett.—I am happy to have the opportunity of explaining that my wish was, in the first instance, to ascer-

tain from Mr. Bryant if it were possible, according to his experience, to recognize those cases which would possibly recover without any operation; in the next place, to show that the operation I referred to was, in one case, of a very serious character. Where the bicuspid tooth was inverted, the operation was no less than the removal of one-half of the lower jaw, which completely destroyed the use of one side of the mouth. It was by no means my intention to criticise the operations that Mr. Bryant performed. I have a high regard for his skill as a surgeon, and I am certain that that which he did was perfectly justifiable; but I wish to obtain some information from him, if possible, as to those cases that might recover without any operation.

Mr. Bryant.—In answer to Mr. Barrett I may say I am afraid that it is only by watching the progress of a case that one can come to anything like an accurate diagnosis. Of course cases of ordinary cysts connected with the jaw due to delayed cutting, will determine themselves by time; in such the swelling does not increase rapidly, and the tooth eventually comes down. In cases where you find the tumour enlarging, and where the period for the ordinary cutting of the tooth has long passed, interference is right, but only such interference as I have suggested—nothing by way of removal, but by cutting into the body of the tumour itself. If you find it is a cyst connected with delayed dentition, you cannot do the patient any harm; if you find it a tumour, you can remove it. As to performing in the present day such a serious operation as extirpation of the upper jaw without previous exploration, there is hardly a surgeon who would consider himself justified in making such an attempt. In the pre-pathological period that was done even by Aston Key; and I have a beautiful preparation of an upper jaw including a dentigerous cyst, but it was not recognized at the time, for these dentigerous cysts have only been fully recognized within the last few years.

The Chairman.—Gentlemen, I am sure you will all agree with me that our best thanks are due to Mr. Bryant for his interesting paper; it is one valuable for its originality, and

commends itself especially to our consideration as bearing so greatly upon those organs it is our special province to treat when diseased. I have also to accord your thanks to Mr. Fletcher and Mr. Oakley Coles, for their Casual Communications, and to the gentlemen who have contributed objects to our Museum. At our next meeting we shall be favoured with Casual Communications from Mr. Luther Holden; from Mr. Ranger, on a case of tumour of upper jaw; from Mr. Spence Bate, "On some Cases in which he has transplanted Teeth," illustrated by models; from Mr. John Fairbank, "On a Case of Irregularity with its Treatment;" and papers by Dr. Beers, of Montreal, "On some Investigations in Dental Physiology and Surgery;" and Mr. Oakley Coles, "On the Mouth during Pregnancy.

GENERAL MONTHLY MEETING.

Monday, June 1, 1874.

EDWIN SERCOMBE, Esq., President, in the Chair.

The Minutes of the previous Meeting were read and confirmed.

The following gentlemen were nominated for membership of the Society :—

Mr. S. J. Hutchinson, L.D.S., London, resident.

Mr. A. Watts Whittingham, L.D.S., Hanley, Staffordshire, non-resident.

The following gentleman was elected a resident Member of the Society :—

Mr. M. W. Halliday, 4, Nottingham Street, London.

Mr. James Stocken was admitted a Member of the Society, by the President.

The Secretary announced the following Donations to the Museum :—

From Mr. Rose, of Liverpool, Twenty-one Specimens of Dental Anatomy and Pathology.

From Mr. Turner, of London, Abnormal Temporary Molar.

From Mr. SPENCE BATE, of Plymouth, Models of Cases, referred to in his paper read at last Meeting of Society.

From Mr. FAIRBANK, Models of Case of Irregularity, described in his Casual Communication.

From Mr. RANGER, Photographs of Case of Tumour of the Jaw, described in his Casual Communication.

Mr. HOLDEN.—Mr. Chairman and Gentlemen,—I am much obliged to my friend, Mr. Thomas Rogers, for giving me permission to come here to-night to ask a question, for really that is the main object of my coming, and I do not believe I could have come to a better place anywhere in Europe to get that question answered. Besides, it has given me the opportunity and the pleasure of seeing your very nice hospital, so well situated, so central, so cheerful, which is a great thing in all matters of dentistry, and with so pleasing a prospect before it. The question I wish to ask is this, and perhaps I can best ask it by stating the case, and then gentlemen will kindly tell me their experience upon the matter. Some two months or more ago, a gentleman, between forty and fifty, rather nearer the latter than the former, called to consult me upon what he said was to him a terrible calamity. He told me that some months ago he had been to a dentist in London in order to have a tooth removed, which had been troublesome. The tooth, a molar, had been taken out, and ever since that time he had lost sensation on that side of the face. I went carefully into the matter and examined the socket from which the tooth had been extracted; it was the second molar of the lower jaw, on the right side. Everything appeared to be quite right: there was no inflammation, no hardness, no tenderness; but on examining the parts where he said he had lost sensation, I found that along the line of the gum in front, up to the symphysis, and also along the line of the teeth and lips,—in short, along the track of the inferior dental nerve from the spot where the tooth had been removed,—

he had completely lost sensation. I asked him if he had any pain. He replied, "No, I should be very glad if I had some pain; for I cannot feel, and that is the worst of it. It is very inconvenient to me, because ever and anon I am biting my lip, which produces a good deal of discomfort and swelling afterwards. What I want to know is, what is the reason of it, and whether I shall ever recover the sensation?" To me the case was a perfect novelty; I had never heard or read of such an accident before. I told him thus much; but that, judging from what I knew of nerves that had been injured in other parts, I had good ground for believing that the sensation would return in time, perhaps a long time. As he pressed me very much as to what I called a long while, I thought I would specify a time, and told him probably five or six months. In the mean time, I told him he had best keep his mouth clean, and use a little astringent lotion. At the end of a month I again saw him, and found matters in precisely the same condition as before. He began to be very uneasy and restless, but still I gave him another dose of assurance that he would recover the sensation. From that time to the present I have not seen him, so that I cannot report any further progress of the case. The question I would venture to put before the Society is as to what the experience of its members has been in cases of this sort, and what is the probability of recovery? I have naturally asked my surgical colleagues, and they all tell me they have never heard of such a case. Now as tooth-drawing is a frequent operation, and is sometimes done by the roughest and rudest hands,—as you know, gentlemen, perfectly well!—and I say, although it is a frequent operation in our hospitals, yet we never hear of the dental nerve thus suffering. I mentioned the case to my friend Mr. Rogers, and he told me that he had met with nothing of the kind in his experience; and he suggested to me, what I am very much obliged to him for doing, viz., that I should come before the Odontological Society and ask its members to give me some information on the subject. Judging from what one has seen of serious injuries to nerves in other parts of the body,—division of nerves, bruising and crushing of nerves,—one has

noticed that after a time, perhaps many months, sensation has returned in cases where one would have really had little ground to expect it. And so I should presume in the case of the dental nerve, that sensation would after a time return.

Mr. Thomas Rogers.—When my friend Mr. Holden put the question to me the other night, I was obliged to confess that although I thought I had had pretty good experience of most of the accidents that happen to patients after the extraction of teeth, I had never met with this particular kind of accident. I told Mr. Holden that I would look through what books I had, to see if any reference was made to it, and I also asked him to be so kind as to bring the case before us. Since then I have looked through my Dental Library, and the only reference I could find bearing upon this case was in one of a series of papers by Mr. Salter, on accidents occurring after extraction, and there I find a reference to three or four such cases. In two or three of them sensation returned after a time; but if I remember rightly, in one of them the injury seemed to be permanent. As regards the general treatment, I cannot imagine that there could be any special treatment beyond that of keeping up the general health. I do not know that there is any special treatment for such injuries to the nerves; I should think a constitutional treatment is the only one, and do not believe that stimulating local applications could be of much use.

Mr. Tomes.—I have seen only one of such cases as that which Mr. Holden has described, and it occurred in my own practice. A middle-aged lady, for whom I removed either the first or second bicuspid on the left side of the lower jaw, afterwards informed me she had no sensation in the lip and gum thereabouts. She came back from time to time, and ultimately sensation was recovered. I think the want of sensation lasted eighteen months; and for a time it was a great distress to her, though less and less as time wore on.

Mr. Braine.—About this time last year I was called in to administer an anæsthetic to a gentleman of about the same age as Mr. Holden's patient. The first molar of the lower jaw was extracted; and immediately on the patient recovering he

said, "One side of my face is paralyzed, and I cannot feel;" and on examination I found that exactly the same parts were paralyzed as regards sensation as those mentioned by Mr. Holden. The tooth was a very long one, I think the longest I have ever seen; and one part of the fang was grooved, and had evidently been in connection with some hard bone inside the jaw. According to length, its point corresponded to just about the part of the inferior maxilla where the inferior dental nerve would lie in the bone. Of course, he was very anxious about the matter, and I told him very much the same as Mr. Holden told his patient. He also mentioned that when he bit on his teeth on that side, they seemed to feel like artificial ones. A slight improvement commenced at the end of ten days, and at the end of five months practically sensation had entirely returned. At the present time, that is one year after the extraction, he continues well and does not notice it, but, experimentally, when you touch those parts, there certainly is still diminished sensation. For instance, he cannot distinguish the difference between touching it with your finger-nail and touching it with the soft end of your finger.

Mr. Coleman.—I may perhaps mention a case that occurred to me some few years ago, in which, after a long operation for the removal of a lower wisdom tooth on the right side, I found the patient had lost sensation of parts supplied by the lingual branch of the fifth pair on that side, and I think it was nearly a year before that side of the tongue recovered perfect sensation. That is the only instance of that kind that I can at the present moment recollect. I think we may account for these cases, in the first place, either by the shock given to the nerve occurring from the sudden removal or breaking away of some of its branches; or it would not be impossible to imagine the inferior dental nerve severed by the sudden breaking away of that portion of the sheath which would be continuous with the branches proceeding to the tooth removed. Or, secondly, we might account for it in the following way: a friend of mine told me that when he was demonstrator of anatomy at St. George's Hospital some years ago, in a dissection he found in a lower jaw, that the dental

nerve passed between two of the fangs of a three-fanged molar, and it struck him at the time that it would be utterly impossible to remove that tooth without a division of the inferior dental nerve. I am inclined to believe that in Mr. Braine's case, the groove he speaks of was where the inferior dental nerve rested upon the fang of the tooth, and that in its removal the nerve was severed.

Mr. Braine.—That is quite my opinion.

Mr. C. West.—A case came under my notice recently where, after an unsuccessful, and apparently very rough, attempt to remove a lower molar tooth, the patient found he had lost control over certain muscles upon that side of the face. Under the influence of nitrous oxide I removed the tooth, and in a very short time, as I learned from his brother, all unpleasant symptoms had subsided.

Mr. Hawkins.—Some three years since a lady patient applied to me to have two teeth extracted in the lower jaw, one on each side. Nitrous oxide gas was administered, and I took them out. The tooth on the right side of the mouth, a second molar, was apparently slightly loose. In this case the teeth were removed without any great difficulty, but immediately upon regaining consciousness, she stated that she felt a numbness over the right side of the face, and was quite unconscious to sensation; I saw her twelve months afterwards and she still assured me that there was not the least sensation on that side of the face. Had I known that Mr. Holden was to favour us with the account of such a case as that he has brought forward, I would have made further inquiry as to the condition of my patient, whose case greatly resembles his.

The President.—The case brought forward by Mr. Holden is very interesting to us; that such cases are very rare is evident from the fact that amongst a considerable number of dentists here assembled, many of whom see a large number of patients every year, so few cases have been spoken of at all similar to that which Mr. Holden has brought before us. I never myself met with a case of the kind. Mr. Tomes tells us he has met

with one, and one or two other gentlemen have met with isolated cases. I think we must, therefore, come to the conclusion that such cases of lesion of the nerve are extremely rare, and are probably due either to some irregular direction which the nerve took, or to some abnormal condition of the nerve-tissue, rendering it unusually easy of laceration. We are all familiar with the fact that blood-vessels and nerves depart from their regular anatomical arrangements in these particulars occasionally. As to a prognosis of the case, we can only hope that that will take place in this, which we know usually takes place in the other parts of the body, namely, that sensation will be restored in time; this Mr. Holden's wide experience as a surgeon has already suggested to him; our united experience does not enable us to throw much additional light on the matter.

Mr. JOHN FAIRBANK.—Mr. President, I have to bring before the Society a case of crowded and irregular front teeth, which, I think, affords a striking example of the effects of extracting the first permanent molar, in order to obtain sufficient space for the regulation of the front teeth. The case is that of a young girl about sixteen years old; the first molars were so much decayed, that I was obliged to extract them. I then made a plate and commenced to pull back the bicuspid teeth. While doing so I experienced great difficulty, both in getting an attachment to the second molar and also, in moving back the bicuspid teeth, I noticed that the second molar began to move forward as the bicuspid teeth moved backwards. I became very dissatisfied with the condition of the masticating teeth, none of which seemed to articulate properly. I felt how much better it would have been if I could have saved the first molar. I think opinions have been expressed in this Society, and I believe Mr. Tomes, in his excellent work, has also mentioned that in these cases of crowded front teeth, the first molar should be extracted, even when it is only slightly decayed. I think this is a mistake, for the first molar is such an important tooth; it is the centre tooth of the masticating teeth, its roots are very large and widely spread, and although it is prone to decay when it is first erupted, still if it is very carefully tended for

the first few years, the enamel becomes harder and the tooth often outlives the bicuspids. The masticating teeth should be moved as little as possible, and when teeth have to be removed to obviate crowding, one of the bicuspid teeth should be extracted, and not the first molar, even when there are one, two, or three cavities in the first molar. Before concluding, I should just observe that the anterior edge of the masticating surface of the second molar is leaning against the neck of the posterior proximal surface of the second bicuspid, and the second bicuspid is looking as it were from an eminence upon the second molar behind it.

The PRESIDENT.—As it will be necessary to examine the models of Mr. Fairbank's case before any remarks can be made on it, I will, to economize time, call on Mr. Ranger for his case, while Mr. Fairbank's models are going round the room.

Mr. RANGER.—This cast was taken from a Welsh woman, admitted to St. Thomas's Hospital on the 9th of May, 1873, under the care of Mr. Simon. She was thirty-five years of age, and had a large globular swelling on the right side of the face, extending laterally from the malar bone to beyond the middle line of the nose, encroaching upon the right nostril, and displacing the left. Extending upwards it formed a sort of platform on the same level with the floor of the orbit. Inferiorly it encroached upon the hard palate, where it presented numerous small ulcers of a fleshy appearance, and filled the cavity of the mouth to a very large extent. The greatest diameter of tumour was that from the inner canthus of the right eye to a spot corresponding with the first upper molar tooth, and measured about two inches. She had suffered an immense amount of pain, and had had no sleep for several nights. Mr. Simon performed the usual operation for removal of the superior maxilla, removing the bone with tumour in two portions, by means of the forceps and saw. She did very fairly for some little time. The incision along the cheek healed by first intention, but the one round the nose suppurated a good deal, and after a few weeks, when the swelling had subsided, there was a

small opening about the size of a pea just by the ala of the nose. Mr. Simon pared the edges of this opening and brought them together by sutures, but unfortunately erysipelas set in, and instead of union, he got a large opening. About this time Mr. Elliott and I were asked to see the patient with a view to make her some appliance, but from the nature of the tumour we were rather fearful of doing anything at that time. The tumour on examination had a peculiar cartilaginous appearance, with numerous ossifying points, and it was very questionable whether it was not of a recurrent type. She now left, and returned again to the hospital in October. Mr. Simon pared the edges of the opening once more, but again failed to get union. He feared to attempt the operation again, and asked us if, as well as making an artificial piece, we could also supply the deficiency in her nose. Although it was rather out of our usual course, we attempted it, and I think very fairly succeeded. We made her an artificial jaw, extending nearly up to the floor of the orbit. Generally we have made these pieces hollow, but in this case the contraction was so great it was impossible to do so. We filled up the cavity with gutta-percha, our object being, by adding to this, after a while to overcome the distortion. This we did to a certain extent, but she was not under treatment long enough to make any very great improvement in that respect. I think if we saw her again at the end of a few months, probably we might be able to add some more gutta-percha, and so get the two sides of the face more in unison. The nose-piece was a considerable amount of trouble. In the first place we had very great difficulty in keeping it in: we made it of white vulcanite, and enamelled it with an enamel brought out by Trueman for enamelling gums. This was too pink, and looked very artificial. After several trials, I found that mixing it with some oxide of bismuth-powder brought it down to a very fair skin tint. We had very little time to make experiments in. She had a sallow complexion, and we got it by heat to rather a yellowish appearance. She did very well, and went away expressing herself perfectly satisfied. She could eat, talk, and drink with the greatest comfort; whereas formerly we could not understand a word she said. This cast represents the face with the artificial nose-piece and the jaw.

Mr. Coleman.—I can well sympathize with Mr. Ranger in regard to the difficulties he has referred to. Some years ago I made, at the request of the late Mr. Skey, an artificial nose for one of his patients. That she had previously worn had been made of thin metal, which caused ulceration where it pressed, and was kept on, as they usually are, by a pair of spectacles. I constructed one of vulcanite, but there was immense difficulty in getting the correct colour. A friend of mine, an artist, undertook to do this, but he said he had never had such a job before; he was a portrait-painter, and had painted upon canvas many hundreds of noses, but never a natural, or rather I should say, artificial, one. The defect, even after he had succeeded pretty well, was this—viz., that if the young lady happened to come in rather warm, the nose looked exceedingly white; and after she had been sitting down a little while and she got pale, the nose then looked exceedingly red. I believe after a little while she became her own artist, and painted her nose, not however to suit all these changes, but according to circumstances. It really is a most difficult matter to produce a colour which shall at all correspond to that of the flesh of the face.

The President.—I have in earlier years made several attempts to make artificial noses. The fitting of the piece to the face has been fairly accomplished; but inasmuch as the colour of the living face is perpetually changing,—it may indeed be only a few shades, but nevertheless changing with every mental emotion,—I have found it impossible to give even to the best fitted and coloured artificial nose anything but an artificial appearance, which may satisfy the eye of the sculptor who only regards form, but will not satisfy those who require colour as well as form.

The Society having had an opportunity of examining Mr. Fairbank's models, I shall be glad to hear any remarks that members may wish to make on them.

Mr. Tomes.—As Mr. Fairbank has alluded to me by name, I feel bound to say something. As regards the question of the removal of first molars, my statement as to the liability of

those teeth to decay was based upon a very extended series of observations; and I still think that if a tooth has to be sacrificed, supposing the first permanent molar to be unsound, it is the best tooth to remove. As regards the maintenance of these teeth, I confess, after considerable experience, I find it extremely difficult to preserve them for any great length of time when the decay commences early, and more especially when it is interstitial. From the cast brought round, it appears to me the malposition of the second molar, which now occupies the position of the first, is possibly due to the influence of a regulation-plate, or something of that kind, because certainly my experience of the second molar does not show that it moves its position simply because the first molar had been removed. I should like to know in what manner Mr. Fairbank has treated that case, and with what kind of apparatus. In the case in which the stumps remain, the second permanent molar appears to be very much longer than in the second case, where the second permanent molar has come forward. I have myself many a time seen teeth pressed into the jaw by regulation-plates, and I have seen bicuspids once or twice in my life, where they have been capped, that have almost disappeared.

Mr. Turner.—It seems to me, on examining these two models closely, that the alteration which has been effected in the mouth has been by the extension of the alveolar arch, and that the bicuspids have not been drawn backwards at all.

Mr. C. West.—I have not seen the models, but I have myself, in regulating children's teeth, met with the same difficulty that Mr. Fairbank has experienced, but I have generally overcome that difficulty by operating upon one side first, and when I have succeeded, after removing the carious first molar, in drawing back the bicuspids and have got the canines in fair position, I have then commenced on the other side. By working on one side at a time you do not meet with the difficulty referred to.

Mr. C. Tomes.—I have some difficulty in understanding, from a physiological point of view, in what way Mr. Fairbank sup-

poses that a tooth after it has been erupted can become stronger and more perfect, for there is no anatomical arrangement by which defects in a tooth once erupted can be remedied. It is true that a tooth which has escaped destruction by caries for a few years has a greater likelihood of ultimate escape than a tooth which has not stood any such trial, but that is quite a different thing from a change occurring in the structure of the tooth; nor can I quite follow Mr. Fairbank in attributing great importance to the first molar as a "centre of mastication," for if the gap were filled up, as it usually is completely, surely the tooth which then came to occupy the position would be as efficient as the lost first permanent molar.

Mr. Thos. Rogers.—Any one who has had long experience of teeth will be inclined to agree that the first molars are the first to decay, but I think the great mistake so often made is in extracting the first molars too early. I cannot help thinking that, as a rule, extracting the first molar is the best way of treating a crowded state of the mouth, from the circumstance that it is the first tooth that goes, but it ought to be retained till the second molar is well up. Then, I think, we have a fairly good opportunity of mastering our case, and we gain what we want, not at the expense of the back of the mouth, which is so liable to happen if we take it out too soon. I should like to hear Mr. Fairbank's explanation, because it seems to me as if the second molar had been pressed back on the jaw by a plate.

Mr. J. Fairbank.—During the first part of the treatment the plate did not cover the molar teeth, but during the latter part, after I had moved the bicuspids back, I did cover the molars with vulcanite, for I found the plate would not keep up in any other way, but the second molar teeth had then moved forwards into the gaps left from extraction of the first molars. A band passed behind the second molar to hold up the plate, and it would have a tendency to press the tooth forward. The bicuspids were first of all wedged apart, and then moved back by gold springs.

On the Condition of the Mouth and Teeth during Pregnancy. By Mr. Oakley Coles.

Mr. President and Gentlemen,—There is an old-fashioned phrase, common amongst a large section of the female community,—"for every child a tooth."

I believe that the accuracy of the statement contained in this old woman's fable may be fairly doubted, but it is nevertheless true, that the period of pregnancy is one in which the oral secretions are subject to considerable alterations, whilst the teeth are peculiarly liable at this time to decay, or to undergo other pathological changes.

In the artificial life of the present day, the teeth are less able to resist the strain made upon them, in common with the other parts of the organism; hence we have during pregnancy an increasing liability to caries with each generation.

The interest of the subject, rather than my own qualification for writing on it, must be my excuse for treating of a matter in connection with which I would sooner have listened to some of the older members of this Society.

I propose in the following paper noticing,—

1. The changes and general condition of the teeth during pregnancy.

2. The condition of the gums.

3. The oral secretions, with their changes and influence upon the teeth.

4. The neuralgia of pregnancy.

And lastly, The remedial agents useful during pregnancy.

1. *The Changes and general Condition of the Teeth during Pregnancy.*—In a large number of cases the period of pregnancy passes by in a perfectly normal manner, the processes that take place are physiological, and no evidence is given (in the mouth, at any rate) of any pathological process having occurred. In other instances we find the first few months of pregnancy accompanied with severe toothache. This is usually (if it be a first pregnancy) attributable to neuralgia, and not to odontalgia. I shall therefore speak of it further on.

When the pain arises from the teeth, we generally find them the subject of caries, though not always. The one variety that I have found the most prevalent is the brown caries. The teeth are discoloured over most of their surface, the margin of the cavity of decay is black, and

beyond the margin, a shading of brown from almost black to a light stone-colour, spreads over the surface of the tooth adjoining the carious part. In the upper incisors and canines there is generally a line of green discoloration on the labial surface of the tooth, following the crescentic outline of the gum, or, in place of the green colouring matter, a dark line of blackish-brown, looking as if the enamel had been charred with a hot iron. The enamel is opaque in appearance and brittle to the touch.

As a rule, the upper and lower bicuspids will be seen in various stages of decay, the lateral incisors of the upper jaw standing next in liability to caries, and then the central incisors ; the lower incisors, as a rule, escape, as under ordinary circumstances, apart from pregnancy.

The women of the lower classes seem more liable to this special description of caries during and subsequently to pregnancy than those of the middle and upper sections of the community.

A second variety that is very interesting, but comparatively rarely seen, is where decay takes place on the prominences of the palatine cusps of the upper bicuspids and molars. The cavity presents a ragged margin, and does not generally give rise to pain, since its existence is soon noticed by the tongue of the patient, and relief sought for at the hands of the dental surgeon. The dentine is found softened, but not much dis-

coloured, nor is the enamel changed in appearance, beyond the opacity surrounding the outline of the cavity.

We shall see the special interest attaching to this peculiarity of situation when speaking of the etiology of caries during pregnancy.

There is still a third description of decay requiring a few words of reference, and that is the soft caries.

Near the margins of the gum and around the necks of the teeth the enamel seems either to have disappeared or to have become so softened in texture, that a sharp excavator or enamel chisel easily passes through it: the teeth are very often exquisitely sensitive, and conscious of every thermal change. The removal of the softened tissue is an operation inflicting considerable pain, and it is very easy to go on cutting away till the pulp-cavity is nearly approached. Sometimes this softened state of the enamel and dentine is confined to a limited area, whilst in other instances it passes round the neck of the tooth like a ring. Whenever it is present, the enamel is generally less opaque in appearance than in the first variety of caries referred to, and there is, as a rule, no green or brown discoloration or deposit on the labial surface of the upper incisors.

All the teeth are liable to an attack of this process of disintegration; but the upper bicuspids, lower bicuspids and molars, and upper laterals

and canines, seem somewhat more subject to it than the rest of the teeth. Such an observation, however, is but of small value, unless extending over a larger area of cases than one observer has the opportunity of seeing.

There is a modification of this last variety, in which we find a general softening of the tooth without any actual decay, as it is ordinarily understood. The whole of the tooth (most frequently in my own experience an upper bicuspid) becomes very sensitive to the touch. A draught of cold air gives severe pain, hot fluids taken into the mouth produce discomfort, and occasionally even an instrument covered with cotton wool, or the touch of a linen napkin, will give a severe shock to the patient's nerves. Later on, in the history of such a case, we find the tooth more loosened from its socket, and at last it becomes a source of so much irritation to the patient, that even within a few weeks of her accouchement, she prefers undergoing the pain of extraction to the constant plague of an aching tooth.

Although we have loosening, there is no great elongation, or, to speak more correctly, protrusion from the socket, and we find that the loosening has been partly due to the absorption of the alveolus that has taken place. On removing the tooth, the periosteum of the fang is seen to be scanty in substance and anæmic in appearance. The tooth can be cut through easily with the

excising forceps or hand-saw; and on examining the pulp, even with an ordinary magnifying-glass, and pressing it between the finger and thumb, we are able to observe its fatty condition, unmistakably distinguishable from the ordinary healthy or inflamed pulp.

The cut portion of the tooth has also a soft greasy surface, very different to that which is felt with any tooth after extraction for inflamed pulp or periosteum with alveolar abscess. We have, I believe, a condition that may be fairly and scientifically called "fatty degeneration."

Although, so far as I am aware, this pathological process has not hitherto been associated with the pregnant state, still it is one that has been fully recognized and described in connection with senile and other forms of decay, by Professor Wedl ("Dental Pathology," pp. 233, 241, 415).

Thus, in treating of the affections of the pulp he writes:—"Fatty degeneration is of frequent occurrence, and is manifested in a general way by its diminished volume and succulency, its recession and pale reddish-grey discoloration, with a trace of yellow. . . . In some parts, the fat-globules form chainlike or fusiform aggregations, and follow the course of the vessels and nerves; in others, the minute fat-molecules are scattered in the interstitial connective tissue, which may be cleared up by the addition of acetic acid or carbonate of soda. . . . The pulps

of milk-teeth also, while the latter are undergoing resorption during the period of dentition, and really are senescent teeth, sometimes become the subjects of the above fatty degenerations, which occur in the same manner and form as with the subsequent teeth." Writing again of atrophy of the pulp, he states :—" The highest grade is displayed in the degeneration of the pulp into a soft greasy mass, unaccompanied by the odour of decomposition. . . . A tooth which has been the subject of a total decay of this description is no longer firmly attached within its alveolus." Whilst still further, when treating of the " Theories of Caries," he says :—" It is a familiar fact, that dead animal tissues undergo a marked fatty degeneration under certain circumstances; . . . fat may also be deposited in dead dentine ; indeed it is found interposed in the dentinal canals in the form of drops."

There is, however, another explanation that may be offered for the softening that takes place in otherwise sound teeth, during pregnancy, and that is either a diminution in the supply of earthy salts, to repair the waste of constant use, or an actual resorption of the calcareous constituents of the teeth, such as takes place in the bones during the progress of osteo-malacia. Osteo-malacia is a disease peculiar to women, and generally connected with the pregnant or puerperal state, and it is quite possible that the condition of the teeth

that we have under consideration may be due to a modification of such a pathological process. This hypothesis is further strengthened by the fact, that in some cases softening takes place without any appearance of fatty degeneration.

It is somewhat singular, though I think it is capable of explanation, that "soft or white caries," with softening and loosening of the teeth unaffected with caries, is more commonly found amongst the upper classes, and those who have the reputation of being well nourished, than amongst the poor and lower middle class. It is perhaps desirable to mention, before leaving this part of the subject, that teeth that have been plugged before pregnancy are as frequently the seat of caries as others; and, moreover, we not unfrequently find that the margins of a cavity will have given way, leaving the plug standing alone, and only held in position by its deeply placed retaining-points.

2. *The Condition of the Gums.*—It may be well to state at once that, so far as my observations have gone, I have failed to discover any condition of the gums that can be regarded as specially and alone connected with the pregnant state. Whilst, therefore, speaking of those changes that take place in the gums, we must bear in mind that their appearance is due to influences that are in operation at other times than during pregnancy,

and that beyond the fact of their coincidence, they would call for no special attention.

When the teeth are the subject of "brown caries," with green deposit on their crowns, and tartar around the necks and fangs, we generally find the margin of the gum raised, glistening, and distended; immediately below the margin there is a well-defined reddish-purple line; occasionally this is of so deep a purple tint that it has been mistaken for a symptom of lead-poisoning; at other times we find midway between the margin of the gum and the purple line an intermediate space covered with cast-off epithelial cells. The surface of the gum is hot and painful to the touch, and bleeds readily. The affection is not confined to any special part of the dental margins, but is nevertheless most severe in the incisive region of both the upper and lower jaw.

In other cases we find the gums of a rather full colour, with their margins rounded, but not very much thickened; they are, however, separated from their attachment to the necks of the lower teeth (the incisors, canines, and bicuspids especially), and on pressing gently from below upwards, on the anterior surface of the gum, a thin fluid, and very often pus, is seen to ooze from around the neck of the tooth and free border of the gum.

This condition is not confined to those who are negligent in the care of their teeth, but will also

be found in mouths where the tooth-brush is used both freely and frequently.

We have here, doubtless, a state of passive congestion owing to impeded circulation, in the course of which a serous or corpuscular transudation takes place through the walls of the distended veins.

Associated (most frequently) with white caries, or softening and loosening of the teeth, we have an anæmic condition of the gums. Here, instead of the margins being thick and rounded, they are thin, pale, and shrivelled in appearance, withdrawn from the necks of the teeth, yet still adherent at a higher point of attachment; not unfrequently there is seen a prominent ridge a little beyond the free border, and this is sometimes of a deeper tint than the surrounding membrane. If any condition of the gums could be said to be especially associated with pregnancy, it would be that which I have just described, more especially as it is notably present in cases of frequently-recurring pregnancy.

3. *The Oral Secretions, with their Changes and Influence upon the Teeth.* — The changes that take place in the oral and buccal secretions are probably the most potent agents in the production of caries during pregnancy. The secretion of saliva is increased to a great extent, in many cases by irritation of the second

and third branches of the fifth pair of nerves, and also by the direct stimulation derived from the acrid eructations of the stomach and the morning sickness during the early months of pregnancy.

Test-papers, applied early in the morning, will determine the acidity of the contents of the mouth in a large majority of the cases examined, especially in first pregnancies; later in the day it is difficult to obtain data by means of test-papers that are of any value, since there are many agencies at work tending to counteract (if present) the acidity of the saliva. Patients will tell you that during their first two pregnancies (in most cases) they awake with an acid taste in the mouth, and after the sickness that usually occurs, the acidity in the mouth is much more pronounced, whilst the vomited matter is so acid in its character, that, even after standing for a considerable time, or if treated at once, by the addition of a little carbonate of soda or potash, a free liberation of carbonic acid takes place.

Before the sickness the secretion of the saliva * and mucus is generally increased, and the flow continues under the influence of the acid principle arising from the stomach.

From the recent investigations that have been

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* "The act of speaking, and also that of vomiting, are preceded by a flow of saliva."—J. Marshall, F.R.S., "Outlines of Physiology," first edition, 1867, p. 56.

made, there can be little doubt, I think, that the most fruitful source of the excessive flow of saliva is the acid matter regurgitated from the stomach, which undoubtedly possesses the power of stimulating the salivary glands. This is a point of great interest in relation to the origin of caries; I must, therefore, enter into the matter more fully than might at a first thought seem needful.

Dr. Sidney Ringer, in his "Handbook of Therapeutics" (p. 78), says:—"It has been fully established by repeated and careful experiments, that dilute acids, when taken into the stomach, possess the power to check its secretion; while, on the other hand, alkalies stand prominent among the most powerful exciters of the secretion of the gastric juice. From these facts the more general law has been inferred—namely, that acids possess the power to check the production of acid secretions from glands, while they increase the flow of alkaline ones, while the very reverse is the case with alkalies, which are supposed to check alkaline but to increase acid secretions. This general law (says the author) is made the more probable, as it fully explains the effects, which experience has shown to be true, of acids on the secretions of the alimentary canal in disease."

We see from the foregoing extract that there is more than one way in which to account both for acidity of the stomach and increased flow of

saliva. The salivary secretion may arise from dental irritation or neuralgia; and I may here mention that this has its analogue in the increased secretion that flows from the lachrymal glands when the ophthalmic division of the fifth is the seat of irritation. This * alkaline saliva being swallowed would increase the flow of the gastric fluids, whilst acrid eructations following, we have the salivary glands still further stimulated.

In Rigby's "System of Medicine" (1853, p. 63), under the head of Disorders of Pregnancy, the author says: — "The breath is usually sour, and an acid state of the saliva is indicated by the instantaneous reddening of litmus-paper laid upon the tongue." There is yet another mode in which increased flow of saliva and the production of an acid reaction may be produced, and that is by the gratification of the morbid taste that sometimes occurs in pregnant women for acid drinks and sour and unripe fruits.

Salivation † may occur, but it is rather rare, and,

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* "When first secreted, and especially during active secretion, the saliva is alkaline; that of the submaxillary is less so than that of the parotid. In fasting, the moisture of the mouth is nearly neutral, or even acid; at that time consisting probably almost entirely of mucus."—Marshall, *op. cit.*, p. 58.

† "The secretions are sometimes preternaturally excited, and one of the most remarkable of the effects of pregnancy is salivation. Some pregnant women have been as completely salivated as if they had been under the influence of mercury;

when present, is "easily distinguished," says Dr. Montgomery (quoted by Dr. Churchill, "Manual of Midwifery," fourth edition, 1860, p. 129), "from the ptyalism induced by mercury, by the absence of sponginess and soreness of the gums, and of the peculiar fœtor, and by the presence of pregnancy."

Hoppe-Seyler (quoted by Wedl, "Pathology of the Teeth," 1873, p. 335) states that after prolonged fasting, and particularly after continued talking, the saliva may become acid. Both of these conditions for inducing acidity generally obtain in women during the pregnant state.

Wright ("Physiology and Pathology of the Saliva," 1842, quoted by Wedl, *op. cit.*, pp. 355, 356) has observed that there are certain acids present in various specific diseases. Thus acetic acid is found in the saliva with aphthæ, indigestion, and after the use of acid wines, whilst hydrochloric acid is found in connection with simple gastric disturbances. The same observer has noticed that in purely facial neuralgia the saliva

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and hence the danger, lest the whole of the irritation should be attributed to the medical attendant if he should have given his patient mercury in any form . . . . It is necessary, therefore, to distinguish between it and mercurial ptyalism. The saliva is simply increased, continuous for a time, and then disappears without leaving any trace of previous irritation. In a few cases it has continued to the end of pregnancy, but generally it ceases at the end of the fourth or fifth month."—Murphy, "Manual of Midwifery," second edition, 1862, p. 53.

is alkaline, whilst in rheumatic pains in the face the saliva is acid. As these various conditions may arise in the course of pregnancy, they are of interest in the consideration of the subject before us. Beyond the changes that take place in the saliva we must notice the alteration in the condition of the mucus of the mouth. This, like the saliva, is secreted in greater quantities in most mouths during the early months of pregnancy; and although, in itself, comparatively innocuous, yet from its peculiar physical character and chemical composition (being rich in albuminoid principles) it tends largely to promote an acid fermentation, by combining with the particles of food lodged between the teeth. (Tomes, "Dental Surgery," 2nd edition, 1873, pp. 555, 557.)

By fermentation we may have lactic acid formed in the mouth. (Tomes, *op. cit.*, p. 724.)

We thus see that under certain conditions the saliva itself may become acid in its re-action; that the buccal mucus, by acting upon the decomposing animal tissues lodged around the teeth, may set up an acid fermentation; and, lastly, that the mouth is likely to be invaded by acid agents in pyrosis and morning sickness. I can hardly imagine that the alkalinity of the salivary or mucous secretion can have any injurious effect upon the teeth, although Dr. Garretson ("A System of Oral Surgery," 1873, p. 255) states that in a condition which he describes as oral typh fever,

"the patient may be said to labour under the dyscrasia of super-alkaline poisoning, the agent having its point of exhibition most markedly in the mouth."

Whilst Professor Gorgas (Harris's "Principles and Practice of Dentistry," 10th edition, 1871, p. 280) considers that caries "results more frequently from the acid contained in the mucous fluids of the mouth, than . . . from such acids as may be generated by the acetous fermentation of particles of food lodged between the teeth"; but it is certain that from the acidity, however it may arise, we sometimes find the tartar dissolved from the surface of the teeth.

After carefully examining the evidence afforded by published works, and the results of my own observations, with special regard to the action of saliva and mucus during the pregnant state, I cannot but conclude that the great prevalence of caries in women at that period is due in a very large measure to the acid conditions that obtain in the mouth.

It is very remarkable, if simply a coincidence, that the brown variety of caries, which I have found most prevalent in the lower classes, should correspond in its appearance with caries produced artificially out of the mouth by means of lactic and butyric acid.

On the influence of lactic acid, Wedl (*op. cit.*, pp. 418 419) mentions that organic chemistry

teaches us that it occurs frequently in partially decomposed animal fluids, and Schmidt has demonstrated the presence of this acid in the fluid obtained from long bones affected with osteomalacia; the analogue of which condition I have endeavoured to show as occurring in some of the teeth during pregnancy. Fischer has also obtained butyric, valerianic, and formic acids from strongly alkaline or acid pus, and Wedl suggests "whether these may not occur as products of the decomposition of the puriform secretions of the gums."

Although in the majority of cases we find increased flow of saliva and mucus, in other instances the amount seems normal; and in these cases it is that we get the white caries and softening, with fatty degeneration, the gums being anæmic and receding, but still attached to the higher part of the necks of the teeth. Decay is not so rapid under these conditions, and seems to indicate impaired nutrition rather than altered secretions as a cause, strengthening negatively the views put forward as to the influence of increased and acidulated fluids in the mouth.

But even here we must not overlook the effects of localized acidity, such as occurs round the margins of the gums, as pointed out by Tomes (*op. cit.*, p. 555), and we must bear in mind that the symptoms which I have described, such as softening and disintegration, with white caries, may

arise from this cause, either alone or in combination with impaired nutrition; for it would, I think, be exceedingly unsafe to declare absolutely the specific cause for a certain condition of the teeth during pregnancy, when there are so many factors operating, the proper value of which it is almost impossible to take into account.

In an earlier part of my paper I referred to the decay that is sometimes seen on the palatine cusps of the bicuspid and molar teeth, and mentioned that this class of caries was interesting from the peculiarity of its situation. There are, I think, two explanations that may be offered for this fact (beyond, of course, the consideration of special structural defect): one is, that the inner cusps of the bicuspids and molars are those against which fluid would be most forcibly ejected in vomiting, and partially so in pyrosis; and further, that the tongue, when at rest, very often lies in contact with these teeth, and so the secretion of acid mucus from the side of the tongue would in time operate injuriously by dissolving the enamel.

Before leaving the subject of saliva, it may be well to state that we must not attach an undue importance to its acid condition as a cause of caries during pregnancy, since in healthy males there is occasionally an acid reaction in the intervals of digestion, and in certain acute diseases the saliva is very commonly acid; in fact, it is

almost the rule to find the saliva giving an acid reaction under such circumstances.

4. *The Neuralgia of Pregnancy.*—When pain arises in the face or in the regions of one or more teeth during pregnancy, without the presence of caries, we may reasonably ascribe it to a neuralgic origin. Whilst, further, neuralgia thus occurring may have no relation to the teeth, but be entirely dependent on either impaired or perverted nutrition. (Anstie.)

It is therefore not singular that we should find it associated with an anæmic condition of the system, and a wasting, rather than carious, condition of the teeth.

This view is clearly set forth in Aitkin's "System of Medicine" (1868, vol. ii. pp. 508—510), where the author states that facial neuralgia occurs, in the great majority of cases, in patients of an anæmic condition, occurring more frequently before thirty than afterwards, and especially in those whose menstruation is irregular either as to time or quantity.

Ramsbotham ("Obstetric Medicine and Surgery," 4th edit., 1856, p. 646), writing of the annoyances connected with the pregnant state, says, "Toothache and facial neuralgia are the most common; violent pain is referred to one tooth, or perhaps to the whole of one side of the jaw, without the presence of caries." And again, Murphy ("Ma-

nual of Midwifery," 2nd edit., 1862, pp. 53, 92), writing of toothache, says, "Pain in the ear and face sometimes causes distress, but the most frequent source of misery is toothache. Some caution is necessary when such a symptom presents itself, especially if there be a decayed tooth. The patient may fly for relief to the usual remedy—extraction. This, however, does not afford the customary benefit. The pain may be removed for a short time, but it soon attacks another tooth, and thus renders extraction useless."

In Tomes's "Dental Surgery," p. 567, it is stated that "the conditions which seem more often to predispose to neuralgia are the exhaustion of over-work: women are also specially subject to neuralgia, as opposed to toothache, in the early months of pregnancy."

It would enlarge too much the present paper to give all the extracts bearing upon the subject of neuralgia during pregnancy, that are to be found in the various works on midwifery and nervous diseases. The condition is one that has been fully recognized, and needs, I think, no further evidence in support of the fact of its occurrence.

In most cases the neuralgia is more severe in the first pregnancy than in the subsequent ones; and this remark applies also to toothache, for, although the caries may advance with successive pregnancies, the pain is much more severe in the early pregnancies than afterwards.

5. There are other changes that take place in pregnancy that demand some attention.

"The blood has a rather lower specific gravity than the average, from the deficiency of blood-corpuscles. The quantity of white corpuscles and of fibrine, on the other hand, is increased." (Kirke's "Physiology," 5th ed., p. 64.)

And further there is an almost unexplained liability in pregnant and puerperal women to plugging of the veins (thrombosis). It is not impossible that this fact may in some measure account for the impaired nutrition, from which the teeth certainly in some cases suffer.

The dropping out of the teeth is, there can be very little doubt, due to an arrested nutrition, and I think has its analogue in the transverse markings of the nails, met with after severe and exhausting diseases.

Wedl, in the "Atlas of Dental Pathology" (plate 5, fig. 50), shows a case of thrombosis occurring in the pulp of a tooth, and mentions that "it sometimes is seen in the pulps of old permanent and temporary teeth that are in a state of resorption." Impaired nutrition, manifested locally, may, however, be due to a perversion of the nutritive elements, or rather the direction of nutrition into a new channel, in order to supply the wants of the growing fœtus. Whether there is resorption of the earthy salts of the tooth, to supply the fœtus with earthy salts, is a question

that is open to doubt, but there certainly seems reason for believing that the deposition of the calcareous matter may not take place, and thus produce a condition equivalent to that in which resorption is supposed to occur.

6. *The Remedial Agents useful during Pregnancy.*—In all affections of the mouth and teeth that may come under the notice of the dental surgeon, it is well to see that the general health is being kept up to the highest state of excellence consistent with the pregnant state.

The diet should be simple, light, nourishing, and non-stimulating,—as nearly approaching that of the ordinary regime as possible. But above all things, I believe the use of oatmeal in any form as an article of diet to be of the greatest value to both the mother and child. It may be taken either as oat-cake or in the form of porridge, with milk or cream.

The taste for unusual dishes should be controlled, and the longing for sour fruit and acid drinks checked, though the derangement of the digestion, of which the craving is but a symptom, must be fully recognized, and proper steps taken to rectify it. Where there is increased acid secretion, either from the mouth or stomach, acids should be administered internally, every precaution being taken that their influence is limited to the stomach, and avoiding as far as possible their

action on the oral and buccal cavities. For this purpose, it is extremely important that the acids employed be administered—within half an hour of taking a meal—by means of a tube, the mouth being immediately rinsed out, either with water or with an alkaline gargle. By this means we secure all the advantages of the acid without any of its local ill effects. Either nitric or hydrochloric acid, or the two combined, may be employed for this purpose. Ten drops of dilute nitric acid with bitter infusion, such as chiretta or calumba, with half a drachm or a drachm of tincture of orange-peel, is a convenient method of administering the acid.

The carious cavities in the teeth should be filled up when it is possible, in order to allay local irritation and pain; and for this purpose I have always found either Hill's stopping or Jacob's gutta-percha the best agents. They are bad conductors and non-irritating,—both qualities of great value in a stopping that is applied at such a time.

When the teeth are the subjects of soft caries, or softening or fatty degeneration of the entire tooth, accompanied with great sensitiveness, I have found collodion of the greatest value. The tooth must first be wiped over with cotton-wool saturated in absolute alcohol, to remove the greasy surface and absorb any moisture. The collodion may then be painted over the whole of

the tooth that appears through the gum, and affords a most efficient yet simple protection against thermal change and irritating substances or liquids. This may be done thrice daily, but as a rule, twice a day will be found to be sufficiently frequent.

Dr. Kock, of Chicago, ("Missouri Dental Journal," April, 1873,) recommends covering the teeth and gums with prepared chalk, for allaying the sensitiveness of the teeth, where there is no caries.

When the teeth appear to be breaking down from the severe strain which the pregnancy puts upon all the resources of the patient, cod-liver oil in small and gradually increasing doses will be found beneficial. As a tooth-powder, precipitated chalk I have found the best, since it not only neutralizes the acidity, but tends to check the flow of saliva if it be in excess.

I have also found charcoal * used at night, with plenty of water and a soft badger-hair tooth-brush, most serviceable as an antiseptic agent for the teeth and gums, and it may also be used as a wash for the mouth before going to bed; thus checking decomposition and acid fermentation from the particles of food that have accumulated between the teeth.

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* Bragg's Vegetable Charcoal is a convenient preparation for this purpose.

Too much importance cannot be attached to the careful use of the tooth-brush before retiring to rest, as it is when the mouth is at rest that a good deal of mischief is done to the teeth. Quinine and chalk as a dentifrice (ʒj. to ℥ij.) are also good in some cases in allaying pain of a neuralgic character, and may be ordered with great advantage.

In periostitis, the usual remedies, such as iodine tincture and carbolic acid, seem the most valuable; whilst both of these agents diluted may be used as a stimulating application to the gums where there are apparently impaired nutritive processes.

The carbolic acid is also very good where there is a deficient secretion of saliva, such as sometimes occurs: the most convenient form is the following:—

℞. Acid. carbolic.	gr. xij.
Glycerin.	ʒ ss.
Aquæ Rosæ	℥j.

In those cases in which a purulent discharge arises from around the necks of the teeth, the chloride of zinc (gr. iij. to ℥j.) is useful; it must be applied well with a brush, so as to thoroughly enter between the tooth and gum.

Chlorate of potash and bromide of potassium may also be used sometimes with advantage in certain conditions of the gums and mucous mem-

brane; chlorate of potash being valuable on account of its healing and antiseptic properties, and bromide of potassium for its reputed sedative and anæsthetic action.

The treatment of neuralgia must vary according to the cause of the disease and the condition of the patient; as a rule, local stimulation is beneficial, by means of either mustard plaster or chloroform applied with liniment (℥j. to ℥vij.); sal volatile, hot tea, large doses of quinine, small doses of alcohol, and light and nourishing food, so as to restore the impaired condition of the nervous system. (Aitkin.)

The remedy that I have, however, found the most useful is the syrup of the phosphate of iron (Parrish's Chemical Food),—a teaspoonful twice daily, ten minutes after meals. This, in my own experience, I have seen give greater relief than many of the agents I have mentioned. Under all circumstances, the treatment must be as gentle as is consistent with efficiency, and all shock saved the already overwrought nervous system of the patient.

Tooth-extraction for odontalgia or neuralgia must never be undertaken without a full recognition of the risk * incurred by the mother and child,

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* "Abortion has been known to follow this simple operation (extraction). Chloroform may be inhaled, or chloric ether administered to relieve the pain; but iron will best remove its cause."—Murphy, *op. cit.*, p. 92.

and the responsibility attaching to the operator; and when absolutely necessary, is, probably, least injurious if performed under the influence of an anæsthetic, such as nitrous oxide or ether, or the two combined.

Discussion.

Mr. Sewell.—The pathological conditions which I understood Mr. Coles to describe as special to pregnancy I do not recognize at all as special to that condition. I do not think he has made out a case showing that the pathological conditions of which he spoke are such as would be associated necessarily with pregnancy. He has not entered minutely into the pathology of what he termed white softening and brown softening. Had he described those conditions more fully, we might, perhaps, have agreed with him. With regard to fatty degeneration of the pulp, which I understood him to ascribe especially to caries associated with pregnancy, I must say that that condition is one which is found in a large number of cases in which there has been chronic inflammation. I should like him to explain what he means when he speaks of fatty degeneration of the teeth. That women during pregnancy suffer from toothache and that the teeth decay rapidly is admitted, but I do not think there is any ground for ascribing the dental disease of that period to any specific or peculiar condition associated with pregnancy. The circumstances which excite the mischief, I think are accidental. The explanation I have come to in my own mind of the matter is this : in the first place, that the vitality of the patients is diminished to some extent during gestation, or rather, perhaps, a great deal of the vital force is occupied in that process, and that, therefore, diseased parts such as the teeth are very likely to increase their morbid action ; and any local pain at such a period is likely to become aggravated into neuralgia. In the second place, with regard to the rapid decay of the teeth which undoubtedly occurs in pregnancy in a large number of cases ; I have always looked upon that as due to the condition of chronic dyspepsia which accompanies these cases. In nearly every case in which the teeth decay rapidly, in my observation, the dyspepsia of pregnancy is present, the condition which we call dyspepsia, and which has associated with it a vitiation of the secretions of the mouth.

Mr. Turner.—The manner in which this subject has been treated by Mr. Oakley Coles has opened up a vast field for discussion, but it has come so suddenly upon us, not having had sufficient notice of the subject, and in our own particular profession we are not always studying cases of pregnancy, that we are scarcely prepared to discuss it. Whether all the phases of caries which he has described are peculiar to pregnant women or not is a matter which I am afraid few of us will agree upon; but this we do know, that we are very often put to a great deal of trouble in treating women who are in this condition;—I mean in treating the teeth. How far we may be justified in following out Mr. Coles's directions for the treatment of our patients is a very grave question to my mind. As a dental surgeon I prefer treating a person locally, and leaving a medical man to follow the constitutional treatment which people require in such cases. The local treatment, so far as I have been able to follow it is, I am sorry to say, very limited indeed. The great thing to give relief is to protect any exposed bone that may exist, and to mitigate the acid condition of the saliva. That is about as far as the dentist can go. I speak now of the treatment of caries; I do not refer to those other matters of which Mr. Coles spoke. I think it is laid down, that to modify or counteract this acid condition as much as possible there should be a free use of carbonate of soda. Mr. Coles speaks of the use of charcoal. Charcoal may be very well as a disinfectant in some instances, but I do not know that people's mouths are generally supposed to be so horribly foul as to require the application of charcoal. This much I do know, that where people have used charcoal for a long time, you will find a blue line round the margin of the gum more resembling the symptom of lead-poisoning than anything I can describe. The fact is it is quite insoluble; it gets under the margin of the gum, and, as many of us have found, it forms an accumulation which it is very difficult to remove.

Mr. Dennant.—I think, if I understood Mr. Coles correctly, he said that the acid secretions of the mouth did not favour, but rather were a corrective to the deposition of tartar. That scarcely accords with my own experience. I generally find

one means of getting rid of tartar in cases where it is deposited very rapidly, is by the application of alkalies, which seem to act as solvents.

The PRESIDENT.—How far Mr. Coles is justified in the conclusions he has drawn, of the various effects produced by pregnancy may be a matter well worthy of discussion. We must all feel, however, that Mr. Coles has treated the subject with considerable care and research. The numerous references he has made to writers on the subject shows that he has not come before us without a great deal of thought, and this would alone entitle him to our warmest thanks. Many of the questions have been brought before us in rather too cursory a manner, that is to say, he has had to condense them so much for the purpose of bringing them within the limits of a paper, that he has scarcely, perhaps, done himself justice by explaining fully his views as to the appearances which the teeth and pulp present during pregnancy. That it is a very common opinion amongst women that with every child they lose a tooth we must all be well aware; whether it is due to the fact of exalted sensation during that period or not I do not know; I am rather inclined to think it is. That the uterus and the teeth appear to be mysteriously sympathetic under conditions of pregnancy is generally believed. Cases have been recorded, and I have had the opportunity of recording two or three myself, where the uterus has been the seat of intense pain, which has led to continual miscarriages, apparently due to diseased teeth. Now if the uterus is the seat of pain, when the exciting cause is a diseased tooth, may not the converse be the case? I regret that in consequence of the Transactions appearing somewhat late, the members of the Society had not sufficient notice of the paper to be brought forward to-night.

Mr. OAKLEY COLES.—I have to thank those gentlemen who have taken part in the discussion, and also the members of the Society for the kindness with which they have received this paper. With regard to Mr. Sewell's questions I quite agree with the conclusions to which Mr. Sewell has evidently

come, that the rapidity with which the teeth decay in a large number of cases during pregnancy is due to a form of chronic dyspepsia, of which the acidity of the saliva is simply one manifestation. I further agree with Mr. Sewell that it is also in part due to impaired or perverted nutrition; so that I think really, if Mr. Sewell and I could talk the matter over together, we should realize that the point of difference between us is a vanishing point.

I quite agree with Mr. Turner that it would not be well for dental surgeons to take such steps as would involve the general treatment of the patient, yet, at the same time, in the treatment of this subject, I have thought it desirable to indicate that the dental surgeon should be prepared to state, in consultation with the medical attendant, what treatment should be adopted. I considered it quite legitimate to introduce it into the paper, and that it would be no breach of professional etiquette for the dental surgeon to suggest what in his experience he deemed the best practice to be adopted.

My chief object in proposing the use of charcoal is that it is such a powerful antiseptic agent, and so accordingly useful where there is an excessively fetid condition of the breath, an accumulation of tartar, and altogether an unhealthy condition of mouth and gums. The blue line mentioned we see constantly occurring in patients coming from India, who have been in the habit of using areca-nut tooth-powder; but I do not think that charcoal should on that account be put aside altogether as a useful agent to be used during the period of pregnancy. What I meant to say in reference to the solution of tartar by the acidity was, that in some cases patients will tell you that they have constant roughness of the teeth, and that it takes place in connection with the acidity, and there seems very little doubt that the tartar is dissolved off the teeth by the acidity. I make that remark without authority, but I think Mr. Charles Tomes has mentioned it in the appendix to the second edition of "Tomes's Dental Surgery."

The PRESIDENT.—In conclusion, I have the pleasure of presenting the thanks of the Society to Mr. Oakley Coles for his interesting paper; also to the following gentlemen: Mr. Rose,

of Liverpool, Mr. Spence Bate, of Plymouth, Mr. Turner, and Mr. Fairbank for donations to the Museum; also to Mr. Luther Holden, Mr. Ranger, and Mr. Fairbank, who have brought casual communications before us to-night. I ought to state that there were two other casual communications offered to us, which time alone forbade our availing ourselves of. Casual communications are assuming a very important feature in our Society, and they are probably not the least instructive and interesting parts of our business. They are practical and fresh, and very often lead to discussions as interesting and as profitable to us, probably, as the papers themselves. We, therefore, are under great obligations to gentlemen who, having interesting cases under their care, bring them before us in the informal manner of a casual communication. It conduces very much to the despatch of business if gentlemen will forward to the secretaries notice of their intention to bring forward such communications a day or two before the day of meeting. I have to state that, in addition to the contributions to the Museum just announced, we have as a society received from H. M. Commissioners of the Annual International Exhibition a very imposing medal in recognition of our contributions to the surgical instrument department of the Exhibition of 1873.

I have further to announce that two members of the Council have made contributions to the property of the Society, one being the Presidential table, and the other the chair on which I have now the honour to sit.

Now, gentlemen, we separate after, I think I may say, a successful session. We met in this room for the first time, as it appears to me, but a very few days ago; and we shall none of us forget that occasion. Time flies very rapidly, especially with men busily engaged, and we are already at the end of the summer session. It only remains for me to say we adjourn our meetings now till the first Monday in November. Between this and then I hope we shall all of us have the opportunity of securing that rest to mind and body which the very fatiguing and exhausting work we have to perform from day to day and from week to week, renders so very necessary. I hope we

shall meet again with renewed strength, having enjoyed the rest which will follow the end of the very busy period of the London season, and prepared to uphold and to extend the operations of the Society to the very utmost. The papers we have had brought before us during the first period of the year have been deeply interesting, and I may venture to say, papers have been promised for the remainder of the year, not at all inferior in interest to those we have already listened to.

I feel I cannot adjourn without expressing my great thankfulness that our members have not been lessened by that great common enemy to us all, death. I am not aware that we have lost a single member of the Society during the six months I have had the honour of occupying the post I now hold. I trust we shall meet with undiminished numbers on the first Monday in November.

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WYMAN AND SONS, PRINTERS, GREAT QUEEN STREET, LONDON, W.C.

Plate V.

Fig 1.

Fig.2.

Wyman & Sons, Del et Lith., London

PATHOLOGICAL SERIES.

Plate V.

ARRESTED DEVELOPMENT OF THE JAWS.

Description of Plate.

Fig. 1.

a—Sharp spine in which the ascending ramus, if such it can be called, terminates; on its inner side is a thin and sharp process, which may perhaps have given attachment to the internal lateral ligament, or may be the representative of the coronoid process.

Fig. 2.

a—Spine which appears to represent the condyle.

b—Spine which, from its position in relation to the alveolar border, appears to be the coronoid process.

No. 73.*—Lower maxilla (of an aged person?), in which the development of the left half of the jaw has ceased at a very early age, so that the stunted horizontal ramus is no longer than that of a nine-months fœtus: the coronoid process and condyle are represented by a simple spine.

The history of this specimen being unknown, it is only explicable by comparison with the similar

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* A figure of this specimen has already appeared in the "Transactions" (see vol. iv. p. 130), but it was thought desirable to introduce it on this plate, for ready comparison with fig. 2. A more full description of its peculiarities is to be found at the page referred to.

specimen figured also on this plate, the whole history of which is preserved.

The growth of the left side of the body of the jaw has been stunted, and it gradually tapers off backwards into an upward curving, pointed process. There is neither condyle nor coronoid process, and there is no vestige of an inferior dental canal; hence, as a matter of course, there is no mental foramen.

The mental prominence, participating in the want of facial symmetry which must necessarily have existed, is displaced to the right, so that the median line (as indicated by the genio-hyoid tubercles on the inner side) lies further to the left, and the stunted side is really shorter, than would appear from the figure, which represents its anterior aspect. The jaw belongs apparently to an individual advanced in life, and the appearance of the alveolar margin would lead to the inference that back teeth had existed, and had been lost some time before the death of the individual; the stunted half is, however, far too short to have admitted of the presence of more than a very few teeth.

ARRESTED DEVELOPMENT OF THE JAWS.

No. 73; Lower maxilla of a young person, in which the development of the left side has been prematurely arrested.

Deposited by J. Tomes, Esq.

The patient from whom this jaw was taken was at one time under the care of Mr. Edward Canton, by whom the specimen was exhibited at the Pathological Society, and was there described by Mr. Tomes. She was of stunted growth, the whole left side of the face was flattened, the external ear almost absent, the zygomatic and auditory processes wanting, and the glenoid cavity a perfectly plane surface.

The ascending ramus is a short narrow process terminating in two points (the coronoid process and the condyle?); on its inner side is a very small inferior dental foramen. The main and the most instructive peculiarity of this jaw may be briefly summed up as the disproportion between its horizontal and vertical development. The backward elongation, dependent largely, as Prof. Köllinke has shown, on ossification in the articular cartilage, has not taken place, there being no condyle, and, consequently, no articular cartilage.

On the other hand, the vertical development, largely and directly dependent upon the teeth (cf. Tomes's "Dental Surgery," 2nd edition, pp. 104, 107; and Prof. Humphrey, "British Journal

of Dental Science," vol. vi. p. 548; and "Dental Cosmos," Feb. 1874 and June 1873), has taken place almost to its full extent; indeed, at the front of the jaw, in consequence of imperfect antagonism of the upper and lower teeth, the vertical depth is actually excessive.

PLATE VI.

NECROSIS OF THE JAW.

No. 25.—Sequestrum and teeth which exfoliated in an apparently healthy subject; the models represent the state of the jaws after the healing process was complete.

Presented by C. J. Fox, Esq.

DESCRIPTION OF PLATE.

Teeth and sequestra exfoliated in consequence of necrosis of the jaw. The lower row comprises all the lower teeth, save the central incisors, while the upper teeth are the second bicuspids and first molars of each side.

THE great peculiarity of this case is the absence of any assignable cause for the necrosis; no history of syphilis, or other constitutional taint could be elicited, nor had any injury been inflicted upon the mouth. The patient had been for some time in hot climates, and was, perhaps, enfeebled by this cause; but the necrosis was apparently quite spontaneous.

PLATE VII.

Models representing the condition of the jaws after the exfoliation had taken place.

Plate VI.

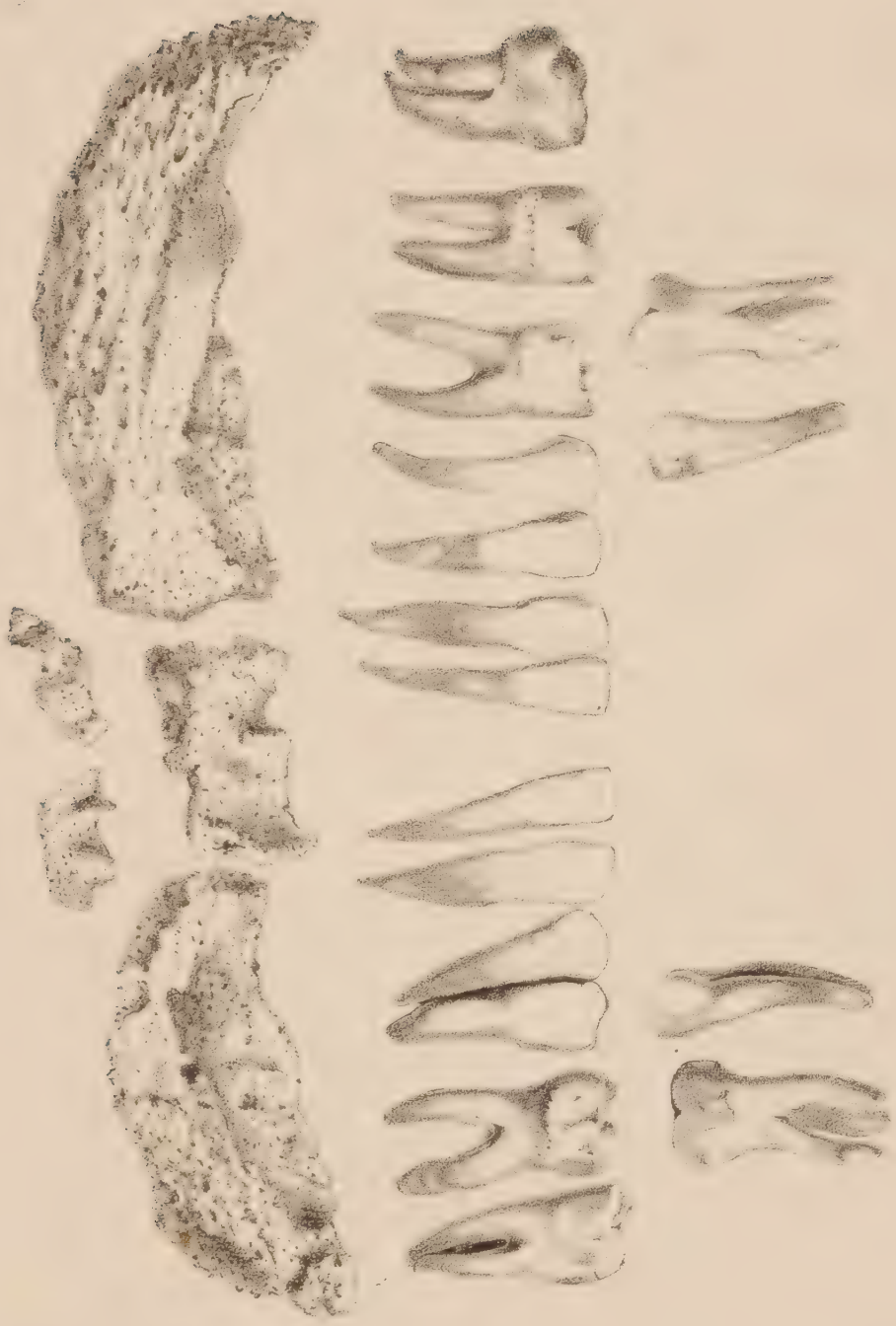

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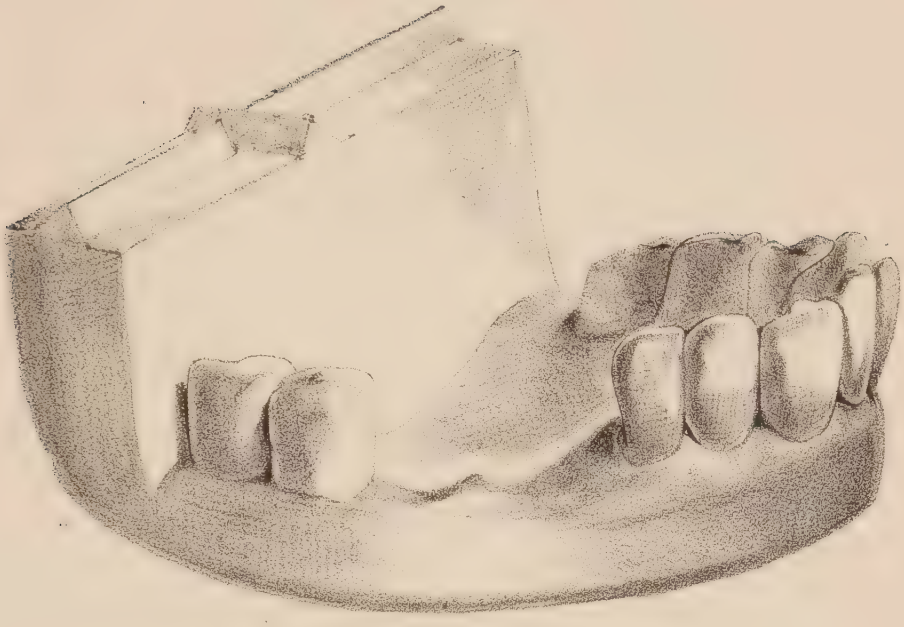
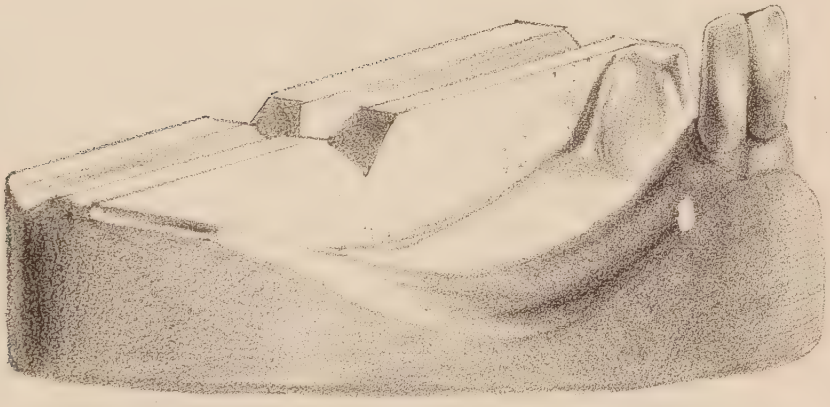
Plate VII.





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